1995

YÖS

YABANCI ÖĞRENCİ SINAVLARI
FOREIGN STUDENT EXAMINATIONS

MATEMATİK 2
MATHEMATICS 2

SORU BANKASI
QUESTION BANK

1098 Alıştırma Sorusu
Exercise Questions

2184 Test Sorusu
Test Questions

144 YÖS Sorusu
YÖS Questions

Türkiye'de ve Dünyada!
In Turkey and Around the World!

METROPOL YAYINLARI

8. Baskı - 8th Edition

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ÖNSÖZ

Değerli öğrenciler,

Metropol Eğitim Kurumları, 1995'den bugüne üniversite giriş sınavlarına hazırlanan öğrencilere kurs, yayın ve rehberlik hizmetleri sunan, Türkiye'de ve Dünyanın farklı ülkelerinde şube ve temsilcilikleri bulunan uluslararası bir eğitim kurumları zinciridir.

Kurumlarımız, Türkiye üniversitelerinin gerçekleştirdikleri Yurtdışından Öğrenci Kabul Sınavları ya da bilinen adıyla Yabancı Uyruklu Öğrenci Sınavlarına (YÖS) hazırlanan ve bu üniversitelerde yüksek öğrenim görmeyi hedefleyen yabancı uyruklu ve T.C. vatandaşı öğrencilere kurs, yayın ve danışmalık hizmetleri vermektedirler.

Türkiye'nin önde gelen üniversitelerinin düzenledikleri bu sınavlarda (YÖS), Temel Öğrenme Becerileri Testi ve Türkçe Yeterlilik Testi olmak üzere iki ayrı test yer almaktadır. Sınavlardaki Türkçe testleri, sınava katılan öğrencilerin Türkçe dil yeterliliklerini ölçmek için uygulanmakta olup, yerleştirme puanlarını etkilememektedir. Temel Öğrenme Becerileri Testleri ise sınavların değerlendirmelerinde ve üniversitelere kabul aşamalarında dikkate alınmakta ve yerleştirmeler bu testlerin sonuçlarına göre yapılmaktadır.

Bu nedenle, sınavlarda başarılı olabilmek için öncelikle Temel Öğrenme Becerileri Testlerinde baraj olarak belirlenen puanları aşmanız ve hedeflediğiniz puanlara ulaşmanız gerekmektedir.

Sınavlardaki Temel Öğrenme Becerileri Testlerinde Genel Yetenek (IQ), Matematik ve Geometri soruları yer almakta olup; bu testlerin ortalama olarak % 40'ının Matematik sorularından oluştuğu dikkate alındığında, bu soruları doğru yanıtlamanız sınavların başarı sıralamalarında öne çıkmanızı sağlayacaktır.

Türkiye'nin seçkin üniversitelerinde öğrenim görebilme şansını yakalayabilmek için YÖS hazırlık kurslarımıza katılmanızı ve yayınlarımızı hazırlamış olan, alanında uzman ve deneyimli öğretmenlerimizden destek almanızı öneririz.

Tüm YÖS adaylarına başarılar dileriz!

PREFACE

Dear students,

Metropol Educational Institutions are a group of international educational institutions since 1995 which have been offering services such as training, publications and consultancy to students who are studying for the university entrance exam and which have branches and representations in Turkey and different countries in the world.

Our Institutions provide courses, publications and consultancy services to foreign and Turkish students who are preparing for the Foreign Students Acceptance Exams alias Foreign Students Exams (YÖS) which are held by the universities in Turkey.

In these exams (YÖS) held by the renowned universities in Turkey, there are two separate tests; Basic Learning Skills Test and Turkish Language Test. The Turkish Language Tests applied in the exams are intended to measure the Turkish language skills of the students who enter the exam and it does not effect on the placement score. The Basic Learning Skills Test is taken into consideration in the evaluation processes of the exams and in the acceptance processes by the universities; the placements are performed according to the results of these tests.

Therefore, in order to be successful in the exams, first of all you need to get higher scores than the base point determined for the Basic Learning Skills Test and reach the scores that you have targeted.

The Basic Learning Skills Tests include Intelligent Quotient (IQ), Mathematics and Geometry questions; considering that Mathematics comprises of the 40% of the questions averagely, giving the correct answers to these questions enables you to come to the forefront in the success ratings of these tests.

We suggest that you participate in YÖS preparation courses and obtain support from expert and experienced teachers who prepare the publications in order to have the chance to receive education in the respected universities of Turkey.

We wish luck to all YÖS candidates!

METROPOL EĞİTİM KURUMLARI
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VORWORT

Liebe Schülerinnen und Schüler,

Die Metropol Bildungsinstitution ist eine internationale Kette, die seit 1995 mit Diensleistungen wie Schulungen, Publikationen und Beratungen Schüler/ -innen auf die Studienberechtigungsprüfung vorbereitet und sowohl in der Türkei als auch in verschiedenen Ländern der Welt Niederlassungen und Vertretungen besitzt.

Unsere İnstitutionen unterstützen Schüler/ -innen türkischer und ausländischer Staatsbürgerschaft, die sich auf die Prüfungen zur Aufnahme von ausländischen Schülern/ -innen alias Prüfung für auslandsstämmige Schüler/ -innen (YÖS), die von den Universitäten in der Türkei veranstaltet werden, vorbereiten und an diesen Universitäten studieren möchten.

Die von renommierten Universitäten angebotene Prüfung (YÖS) ist in zwei Bereichen erfolgreich zu bestehen. Der erste Teil betrifft die Fähigkeit Grundlagenkenntnisse zu erwerben, wobei der zweite Teil die Sprachkenntnisse im Türkischen prüft.

Mit Hilfe dieser Eignungstests werden die türkischen Sprachkenntnisse der Schüler/ -innen ermittelt, dabei haben sie keinen Einfluss auf die Platzierungspunkte. Ausschlaggebend für die Platzierung der Bewerber/innen an den Universitäten ist der Grundlernfähigkeitstest, bei dem die allgemeine Mindestpunktzahl der Prüfung und die erforderliche Punktzahl des erstrebten Studienfachs zu erreichen ist.

Dieser Test beinhaltet Fragen zur allgemeinen Fähigkeit (IQ), Mathematik und Geometrie. In Anbetracht der Tatsache, dass der Mathematik 40% der Prüfung darstellt, ist es für Sie von Vorteil den Fokus auf diesen Bereich zu legen, um unter die Besten zu kommen.

Um an den renommierten Hoschulen der Türkei studieren zu können, empfehlen wir Ihnen, an unseren YÖS-Vorbereitungskursen teilzunehmen und sich von unseren kompetenten und erfahrenen Lehrkräften , die die Publikationen vorbereitet haben, untersützen zu lassen.

Wir wünschen allen YÖS Kandidaten viel Erfolg!

ВСТУПЛЕНИЕ

Уважаемые студенты!

Образовательные учреждения Metropol – это международная сеть учебных заведений, которая с 1995 года по сегодняшний день предоставляет для студентов, готовящихся к вступительным экзаменам в университет, поддержку в виде курсов, публикаций и консультаций. Образовательные учреждения Metropol имеют филиалы и представительства в Турции и в разных странах мира.

Наши учреждения оказывают поддержку иностранным и турецким студентам, которые нацелены получить высшее образование в университетах Турции и готовятся к сдаче вступительных экзаменов для иностранных студентов, известных как экзамены для иностранных студентов YÖS, проводящихся данными университетами.

Экзамены YÖS организуются ведущими университетами Турции и состоят из двух отдельных частей: теста "Основные навыки обучения" и экзамена на знание турецкого языка. Тест на знание турецкого языка включен в экзамен для определения уровня владения турецким языком студентов, сдающих экзамен, и на распределение результатов не влияет. Распределение осуществляется на основании результатов теста "Основные навыки обучения", который принимается во внимание при оценке экзамена и на этапе приёма в университет.

Поэтому, для того, чтобы успешно сдать экзамены, прежде всего, Вы должны получить более высокий балл, чем граничный балл, определенный для теста "Основные навыки обучения", и достичь запланированной оценки.

Экзаменационный тест "Основные навыки обучения" содержит вопросы на уровень интеллекта (IQ), вопросы по математике и геометрии. Учитывая, что 40% вопросов теста составляют вопросы на уровень интеллекта (IQ), правильно

Для того, чтобы иметь возможность получить образование в элитных вузах Турции, мы предлагаем вам принять участие в подготовительных курсах YÖS и получить поддержку наших опытных преподавателей, которые являются специалистами в своей области и готовят наши публикации.

Мы желаем успехов всем кандидатам, готовящимся к экзамену **YÖS**!

METROPOL BILDUNGSINSTITUTIONEN

ОБРАЗОВАТЕЛЬНЫЕ УЧРЕЖДЕНИЯ METROPOL

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BÖLÜM
CHAPTER 1

TARİHSEL NOT / HISTORICAL NOTE

CAHİT ARF [1910 – 1997]

Türk matematikçi ve bilim insanı. TÜBİTAK Bilim Kolu eski başkanı. Cebir konusundaki çalışmalarıyla dünyaca ün kazanmıştır. Cisimlerin kuadratik formlarının sınıflandırılmasında ortaya çıkan değişmezlere ilişkin ARF değişmezi ve ARF halkaları gibi literatürde adıyla anılan çalışmaların yanı sıra "Hasse-ARF Teoremi" adı ile anılan teoremi matematik bilimine kazandırmıştır. Cahit ARF, matematiği bir meslek dalı olarak değil, bir yaşam tarzı olarak görmüştür. Öğrencilerine sürekli: "Matematiği ezberlemeyin, kendiniz yapın ve anlayın." demiştir.

Turkish mathematician and scientist. Former chairman of the TUBITAK Science Branch. His work on algebra has gained worldwide fame. In addition to the studies in the literature such as the Arf invariant and Arf rings related to the invariants that emerged in the classification of quadratic forms of the objects, he introduced the theorem called "Hasse-Arf Theorem" to mathematical science. Cahit Arf saw mathematics as a lifestyle rather than a profession. He constantly told his students: "Do not memorize the math, do it yourself and understand it."

POLİNOMLAR
POLYNOMIALS

Bu bölüm 64 alıştırma sorusu, 168 test sorusu, 12 YÖS sorusu içermektedir.

This chapter includes 64 exercise questions, 168 test questions, and 12 YÖS questions.

BÖLÜM / CHAPTER 1

POLİNOMLAR / POLYNOMIALS

- Polinomlar / Polynomials .... 3 – 34

BÖLÜM 01 CHAPTER

POLİNOMLAR
POLYNOMIALS

1. P(x) bir polinomdur.

P(x) is a polynomial.

$P(x) = 4 \cdot x^{\frac{m+6}{m}} + 2x - 1$

$\Rightarrow \sum m = ?$

Yanıt / The Answer is 12

2. P(x) bir polinomdur.

P(x) is a polynomial.

$P(x) = x^{\frac{12}{m}} + x^{m-4} - 3x + 1$

$\Rightarrow \sum m = ?$

Yanıt / The Answer is 22

3. $der[P(x)] = 6$

$der[Q(x)] = 3$

$\Rightarrow der[Q(x) + P(x)] = ?$

Yanıt / The Answer is 6

4. $der[P(x)] = 5$

$der[Q(x)] = 3$

$\Rightarrow der[P(x) \cdot Q(x)] = ?$

Yanıt / The Answer is 8

5. $der[P(x+1)] = 8$

$der[2 \cdot Q^2(x)] = 4$

$\Rightarrow der\left[\frac{P(x)}{Q(x)}\right] = ?$

Yanıt / The Answer is 6

6. $der[P(x)] = 2$

$der[Q(x)] = 4$

$\Rightarrow der\left[\frac{Q^2(x)}{P(x)}\right] = ?$

Yanıt / The Answer is 6

7. $der[P(x)] = 3$

$der[Q(x)] = 4$

$\Rightarrow der[P^2(x) \cdot Q(x)] = ?$

Yanıt / The Answer is 10

8. $der[P(x) \cdot Q(x^2)] = 9$

$der\left[\frac{P(x)}{Q(x)}\right] = 3$

$\Rightarrow der(P(x) + Q(x)) = ?$

Yanıt / The Answer is 5

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9. $P(x) = x^3 - x + 1$

$\Rightarrow$ **$P(2) = ?$**

Yanıt / The Answer is 7

10. $P(x+1) = x^2 - 4x + 1$

$\Rightarrow$ **$P(-1) = ?$**

Yanıt / The Answer is 13

11. $P(3x-1) = x^2 - x$

$\Rightarrow$ **$P(5) = ?$**

Yanıt / The Answer is 2

12. $P(5x-10) = 2x^3 + x - 1$

$\Rightarrow$ **$P(0) = ?$**

Yanıt / The Answer is 17

13. $P(x-2) = x^2 + 5x - 1$

$\Rightarrow$ **$P(2) - P(-2) = ?$**

Yanıt / The Answer is 36

14. $P(x+3) = x^2 - 2x + 4$

$\Rightarrow$ **$P(2) - P(-1) = ?$**

Yanıt / The Answer is –21

15. $P(x) = x^2 + 4x + 4$

$\Rightarrow$ **$P(\sqrt{2} - 2) = ?$**

Yanıt / The Answer is 2

16. $P(x-3) = x^2 - 4x + 3$

$\Rightarrow$ **$P(x) = ?$**

Yanıt / The Answer is $x^2 + 2x$

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17. $P(2-x)=x^2+2x+1$

$\Rightarrow$ **$P(x)=?$**

Yanıt / The Answer is $(3-x)^2$

18. $P(2x-1)=x^2-3x+1$

$\Rightarrow$ **$P(2x+3)=?$**

Yanıt / The Answer is x^2+x-1

19. $P(x^2)=4x^6+3x^4-2x^2+1$

$\Rightarrow$ **$P(x)=?$**

Yanıt / The Answer is $4x^3+3x^2-2x+1$

20. $P(x^3-1)=2(x^3-1)^2-x^3+3$

$\Rightarrow$ **$P(x)=?$**

Yanıt / The Answer is $2x^2-x+2$

21. $\dfrac{P(x-1)}{x+5}=3\cdot Q(x)-11$

$P(4)=10 \Rightarrow$ **$Q(5)=?$**

Yanıt / The Answer is 4

22. $P(x+1)-Q(x-2)=x^2-x-4$

$P(-1)=3 \Rightarrow$ **$Q(-4)=?$**

Yanıt / The Answer is 1

23. $P(x)=(m-1)x^3-4x^2-(2n+1)x+5$

$Q(x)=kx^2+3x-r$

$P(x)=Q(x) \Rightarrow$ **$m+n+k+r=?$**

Yanıt / The Answer is -10

24. $P(x)+P(x-1)=4x-6$

$\Rightarrow$ **$P(x)=?$**

Yanıt / The Answer is $2x-2$

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25. $P(x) = x^3 - 3x^2 + 2x + 6$

$Q(x) = -x^3 + 3x - 1$

$\Rightarrow$ **$P(x) - Q(x) = ?$**

Yanıt / The Answer is $2x^3 - 3x^2 - x + 7$

26. $P(x+1) = x^2 + 2x + 1$

$Q(x-2) = x^2 - 4x + 4$

$\Rightarrow$ **$P(x) + Q(x) = ?$**

Yanıt / The Answer is $2x^2$

27. $P(x) = x^3 - 2$

$Q(x) = x + 2$

$\Rightarrow$ **$P(x) \cdot Q(x) = ?$**

Yanıt / The Answer is $x^4 + 2x^3 - 2x - 4$

28. $(x-2) \cdot (x^2 + mx - 2) = x^3 + nx^2 - 8x + 4$

$\Rightarrow$ **$m + n = ?$**

Yanıt / The Answer is 4

29. $\frac{2x-1}{x^2 - 3x - 4} = \frac{A}{x-4} + \frac{B}{x+1}$

$\Rightarrow$ **$A + B = ?$**

Yanıt / The Answer is 2

30. $\frac{4x-2}{x^2 - 5x + 6} = \frac{A}{x-3} + \frac{B}{x-2}$

$\Rightarrow$ **$A + B = ?$**

Yanıt / The Answer is 4

31. $\frac{5x-2}{x^2 - 4} = \frac{A}{x-2} + \frac{B}{x+2}$

$\Rightarrow$ **$A - 2B = ?$**

Yanıt / The Answer is –4

32. $x^3 - 2x^2 + x - 1$ divided by $x + 1$ gives quotient $Q(x)$, remainder -5

$$\begin{array}{l|l} x^3-2x^2+x-1 & x+1 \\ \hline - & Q(x) \\ \quad -5 & \end{array}$$

$\Rightarrow$ **$Q(x) = ?$**

Yanıt / The Answer is $x^2 - 3x + 4$

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33. $\begin{array}{l|l} x^6+x^4-2x^2+2 & x^4+1 \\ \cline{2-2} - & \\ \hline \quad K(x) & \end{array} \Rightarrow$ **$K(x)=?$**

Yanıt / The Answer is $-3x^2+1$

34. $P(x)=x^4-3x-2$

$\begin{array}{l|l} P(x) & x+1 \\ \cline{2-2} - & \\ \hline K(x) & \end{array} \Rightarrow$ **$K(x)=?$**

Yanıt / The Answer is 2

35. $P(x)=4x^2-4x+1$

$\begin{array}{l|l} P(x-1) & x+1 \\ \cline{2-2} - & \\ \hline K(x) & \end{array} \Rightarrow$ **$K(x)=?$**

Yanıt / The Answer is 25

36. $P(2x-3)=4x^2-10x+3$

$\begin{array}{l|l} P(x-2) & x-3 \\ \cline{2-2} - & \\ \hline K(x) & \end{array} \Rightarrow$ **$K(x)=?$**

Yanıt / The Answer is -1

37. $P(x-1)=x^3-2x^2+2$

$\begin{array}{l|l} P(x+2) & x-1 \\ \cline{2-2} - & \\ \hline K(x) & \end{array} \Rightarrow$ **$K(x)=?$**

Yanıt / The Answer is 34

38. $P(x+1)=x^3-5x^2+kx-1$

$\begin{array}{l|l} P(x) & x-2 \\ \cline{2-2} - & \\ \hline 0 & \end{array} \Rightarrow$ **$k=?$**

Yanıt / The Answer is 5

39. $P\left(\frac{x}{9}\right)=\frac{1}{3}x^2+\frac{1}{27}x-\frac{1}{9}$

$\begin{array}{l|l} P(x) & x-\frac{1}{3} \\ \cline{2-2} - & \\ \hline K(x) & \end{array} \Rightarrow$ **$K(x)=?$**

Yanıt / The Answer is 3

40. $\begin{array}{l|l} x^4+kx^3-mx^2+5x+3 & x^2-1 \\ \cline{2-2} - & \\ \hline \qquad\qquad 0 & \end{array} \Rightarrow$ **$k+m=?$**

Yanıt / The Answer is -1

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41. $\begin{array}{r|l} P(x) & x-1 \\ \hline 7 & \end{array}$ $\begin{array}{r|l} P(x) & x+3 \\ \hline -1 & \end{array}$ $\begin{array}{r|l} P(x) & (x-1).(x+3) \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is 2x+5

---

42. $P(3x) = (x^2 + 2x) \cdot Q(x-1) + x - 2$

$\begin{array}{r|l} P(x) & x-6 \\ \hline 4 & \end{array}$ $\begin{array}{r|l} Q(x) & x-1 \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is $\frac{1}{2}$

---

43. $(x-1) \cdot P(x+1) = x^3 - ax + 2$

$\Rightarrow$ **P(2) = ?**

Yanıt / The Answer is 0

---

44. $\begin{array}{r|l} P(x) & Q(x) \\ \hline 4x+2 & x-1 \end{array}$ $\begin{array}{r|l} P(x) & x-1 \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is 6

---

45. $P(x-2) = x^3 + 4x^2 - 5x + 2$

$\begin{array}{r|l} P(x+1) & x-1 \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is 110

---

46. $\dfrac{P(x-2)}{Q(x+2)} = 4x - 8$

$\begin{array}{r|l} Q(x) & x-5 \\ \hline 3 & \end{array}$ $\begin{array}{r|l} P(x) & x-1 \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is 12

---

47. $\begin{array}{r|l} P(x) & x^2-5x+6 \\ \hline 2x-1 & \end{array}$ $\begin{array}{r|l} P(x) & x-3 \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is 5

---

48. $\begin{array}{r|l} P(x) & x^2-1 \\ \hline 2x-1 & Q(x) \end{array}$ $\begin{array}{r|l} P(x) & x-1 \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is 1

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49. $\begin{array}{r|l} P(x) & x+2 \\ \cline{2-2} \underline{-\quad} & Q(x) \\ -3 & \end{array}$ $\quad \begin{array}{r|l} Q(x) & x-1 \\ \cline{2-2} \underline{-\quad} & \\ 5 & \end{array}$ $\quad \begin{array}{r|l} P(x) & x^2+x-2 \\ \cline{2-2} \underline{-\quad} & \\ K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is 5x+7

53. $P(x)+P(x+1)=4x^2-6x+5$

$\Rightarrow$ **P(x) = ?**

Yanıt / The Answer is $2x^2-5x+4$

50. $\begin{array}{r|l} P(x) & x-1 \\ \cline{2-2} \underline{-\quad} & Q(x) \\ -1 & \end{array}$ $\quad \begin{array}{r|l} Q(x) & x+1 \\ \cline{2-2} \underline{-\quad} & \\ 4 & \end{array}$ $\quad \begin{array}{r|l} P(x) & x^2-1 \\ \cline{2-2} \underline{-\quad} & \\ K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is 4x–5

54. $P(x-2)=x^3-4x^2+3x+a$

$P(x+1)= \ldots\ldots + 7x^0$

$\Rightarrow$ **a = ?**

Yanıt / The Answer is 7

51. $P(x)=-x^4+ax^2+bx-4$

$\begin{array}{r|l} P(x) & x^2-3 \\ \cline{2-2} \underline{-\quad} & \\ 3x+11 & \end{array}$ $\Rightarrow$ **a+b=?**

Yanıt / The Answer is 11

55. $\dfrac{P(x-1)}{Q(x+1)}=3x-5,$

$Q(x)= \ldots\ldots + 3x^0$

$\begin{array}{r|l} P(x) & x+2 \\ \cline{2-2} \underline{-\quad} & \\ K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is –24

52. $\begin{array}{r|l} 2x^4+3x^2+ax+b & x^2-x-5 \\ \cline{2-2} \underline{-\quad} & \\ 20x+80 & \end{array}$ $\Rightarrow$ **a + b = ?**

Yanıt / The Answer is 0

56. $\begin{array}{r|l} P(x) & x+1 \\ \cline{2-2} \underline{-\quad} & \\ 8 & \end{array}$ $\quad \begin{array}{r|l} Q(x) & x+1 \\ \cline{2-2} \underline{-\quad} & \\ 12 & \end{array}$ $\quad \begin{array}{r|l} P(x)-Q(x) & x+1 \\ \cline{2-2} \underline{-\quad} & \\ K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is –4

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57. $\begin{array}{r|l} x^3-2x^2+ax+b & x^2+1 \\ \cline{2-2} - & Q(x) \\ \hline 0 & \end{array}$ $\Rightarrow$ **a + b = ?**

Yanıt / The Answer is –1

58. $\begin{array}{r|l} P(x) & x^2+x-2 \\ \cline{2-2} - & \\ \hline 3x-2 & \end{array}$ $\begin{array}{r|l} P(x) & x-1 \\ \cline{2-2} - & \\ \hline b & \end{array}$ $\begin{array}{r|l} P(x) & x+2 \\ \cline{2-2} - & \\ \hline a & \end{array}$ $\Rightarrow$ **a + b = ?**

Yanıt / The Answer is –7

59. $P(x)=x\cdot(x-1)\cdot(x-2)\cdot Q(x)+x^2-2x+13,$

$\begin{array}{r|l} P(x) & x^2-3x+2 \\ \cline{2-2} - & \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is x+11

60. $P(x-2)+P(x+2)=4x+2,$

$\begin{array}{r|l} P(x) & x+3 \\ \cline{2-2} - & \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is –5

61. $\begin{array}{r|l} P(x-3) & x-1 \\ \cline{2-2} - & \\ \hline 27 & \end{array}$ $\begin{array}{r|l} P(x-3) & x-9 \\ \cline{2-2} - & \\ \hline 3 & \end{array}$ $\begin{array}{r|l} P(x) & x^2-4x-12 \\ \cline{2-2} - & \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is $-3x+21$

62. $\begin{array}{r|l} P(x) & x-3 \\ \cline{2-2} - & \\ \hline 2m & \end{array}$ $\begin{array}{r|l} P(x) & x-2 \\ \cline{2-2} - & \\ \hline m & \end{array}$ $\begin{array}{r|l} P(x) & (x-3)\cdot(x-1) \\ \cline{2-2} - & \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is mx – m

63. $P(x)=ax^6+2bx^4+3x-5$

$\begin{array}{r|l} P(x) & x-1 \\ \cline{2-2} - & \\ \hline 0 & \end{array}$ $\begin{array}{r|l} P(x) & x+1 \\ \cline{2-2} - & \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is –6

64. $P(x,y)=(x+y-1)^3-3x-3y,$

$\begin{array}{r|l} P(x,y) & x+y-1 \\ \cline{2-2} - & \\ \hline K(x) & \end{array}$ $\Rightarrow$ **K(x)=?**

Yanıt / The Answer is –3

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1. P(x) bir polinomdur.

P(x) is a polynomial.

$P(x) = x^{n-2} + x^{4-n} - 2$

$\Rightarrow$ **n = ?**

A) {2} B) {2,3} C) {2,3,4} D) {2,4} E) {5}

2. $P(x) = x^{n-7} + 2 \cdot x^{9-n} \Rightarrow \sum n = ?$

A) 20 B) 22 C) 23 D) 24 E) 25

3. P(x) bir polinomdur.

P(x) is a polynomial.

$P(x) = x^{\frac{36}{n}} + x^{\frac{n}{4}} + 1 \Rightarrow \sum n = ?$

A) 40 B) 48 C) 52 D) 60 E) 70

4. der [P (x)] = 4,

der [Q (x)] = 3

$\Rightarrow$ **der $[P^2(x) \cdot Q(x^2)]$ = ?**

A) 12 B) 13 C) 14 D) 10 E) 8

5. $P(x) = (x^4 + x^2)^4$

$Q(x) = 3x^3 - 1 \Rightarrow$ **der$\left[\frac{P(x)}{Q(x)}\right]$ = ?**

A) 13 B) 14 C) 15 D) 16 E) 17

6. $der[P^2(x) \cdot Q(x)] = 8$

$der\left[\frac{P(x)}{Q(x)}\right] = 1$

$\Rightarrow$ **der[P(x) + Q(x)] = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

7. P(x) bir polinomdur.

P(x) is a polynomial.

$P(x) = x^{m-4} + x^{7-m} + 3$

$\Rightarrow$ **max(der[P(x)]) = ?**

A) 1 B) 2 C) 3 D) 7 E) 11

8. $der[P(x) \cdot Q^2(x)] = 6$,

$der[P^2(x) \cdot Q(x)] = 12$

$\Rightarrow$ **der[Q(x)] = ?**

A) 1 B) 6 C) 3 D) 0 E) 5

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9. $P(x) = (3a-1)x^4 + (b-2)x^3 + 5x^2 - 3$

$der[P(x)] = 2 \Rightarrow$ **a + b = ?**

A) $\frac{4}{3}$ B) $\frac{5}{3}$ C) 2 D) $\frac{7}{3}$ E) 3

10. $P(x) = 3x^5 - 4x^2 + 2,$

$der[P(x) \cdot Q(x)] = 15 \Rightarrow$ **$der[x^3 \cdot Q(x)] = ?$**

A) 6 B) 8 C) 10 D) 12 E) 13

11. $P(x) = x^5 - 3x^2 - 1,$

$Q(x) = 2x^4 + 5x^3 + 4 \Rightarrow$ **$der\left[P^2(x) \cdot Q(x)\right] + der\left[\frac{P(x^3)}{x^2 \cdot Q(x)}\right] = ?$**

A) 14 B) 16 C) 20 D) 23 E) 24

12. $n \in N,$

$der[P(x)] = 7n + 3$

$der[Q(x)] = 3n + 4$

$der[P(x) \cdot Q(x)] = 27$

$\Rightarrow$ **$der[P(x)] = ?$**

A) 9 B) 13 C) 15 D) 17 E) 19

13. $n \in N,$

$P(x) = x^{\frac{24}{n-2}} + x^{n+3}$

$\Rightarrow$ **$\max\left(der[P(x)]\right) = ?$**

A) 29 B) 27 C) 25 D) 17 E) 11

14. $P(x) = (x^2 - x)^m \cdot (2x^4 - 1)^2 \cdot (4x^3),$

$der[P(x)] = 25 \Rightarrow$ **m = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

15. $der[P^2(x) \cdot Q(x^3)] = 12,$

$der\left[\frac{P(x^3)}{Q^2(x)}\right] = 5 \Rightarrow$ **$der[5 \cdot P(x) + 2 \cdot Q(x)] = ?$**

A) 3 B) 9 C) 10 D) 12 E) 16

16. $der[P(x)] = 4, \; der[Q(x)] = 3$

$\Rightarrow$ **$der\left[\frac{P^2(x^3)}{Q(x^2)}\right] = ?$**

A) 18 B) 16 C) 12 D) 9 E) 6

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1	2	3	4	5	6	7	8
C	D	C	C	A	C	C	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	E	D	D	A	B	A	A

1. P(x) bir polinomdur.

P(x) is a polynomial.

$x^4 \cdot P(x) = ax^6 + bx^5 + (a-2)x^3 + (b-a-1)x^2$

$\Rightarrow$ **P(−2) = ?**

A) −2 B) −1 C) 0 D) 1 E) 2

2. $P(x) = 64x^2 - 8x + 21 \Rightarrow$ **P(0) = ?**

A) 21 B) 45 C) 54 D) 64 E) 77

3. $P(3x - 6) = x^3 + 4x^2 - 9x - 2$

$\Rightarrow$ **P(0) = ?**

A) −2 B) −1 C) 0 D) 2 E) 4

4. $P(2x + 3) = x^2 + 6x + b$,

$P(1) = 10 \Rightarrow$ **b = ?**

A) 5 B) 9 C) 12 D) 15 E) 18

5. $P(x) = (a - 3)x^2 - 3ax - 7$,

$P(1) = -4 \Rightarrow$ **P(−2) = ?**

A) −49 B) −36 C) −24 D) −9 E) −1

6. $P\left(\frac{2-3x}{4}\right) = -2x^3 + 2x^2 + ax$,

$P(-1) = 2 \Rightarrow$ **a = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

7. $P(x) = -3x^3 + ax^2 - x + 1$,

$4 \cdot P(1) + P(2) = -5 \Rightarrow$ **a = ?**

A) −4 B) −2 C) 0 D) 2 E) 4

8. $P(x) = (x^3 - 4x + 1)^3 \cdot (x^2 - x + 2)^2$,

$P(1) = A,\ P(0) = B$

$\Rightarrow \frac{A}{B^2} = ?$

A) −4 B) −2 C) 2 D) 4 E) 6

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9. $P(x^3) = ax^9 + (a-3)x^8 + (b-2)x^7 + bx^3$,

$9 \cdot P(-1) = -18 \Rightarrow$ **b = ?**

A) $-\frac{1}{2}$ B) $-\frac{1}{4}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

10. $P(x) = x^3 + 3x^2 + 3x + 1$

$\Rightarrow$ **$P(\sqrt[3]{10} - 1) = ?$**

A) 1 B) 5 C) 10 D) 15 E) 20

11. $P(x) = x^3 - 6x^2 + 12x - 8$

$\Rightarrow$ **$P(2 + \sqrt[3]{3}) = ?$**

A) –3 B) –1 C) 0 D) 3 E) 9

12. $(x-1) \cdot P(x) = x^4 - ax^2 + 2x + 7$

$\Rightarrow$ **a = ?**

A) 7 B) 8 C) 10 D) 12 E) 14

13. $(x-3) \cdot P(x) = x^3 - ax^2 - 9$

$\Rightarrow$ **$P(3) = ?$**

A) 9 B) 12 C) 15 D) 18 E) 21

14. $(x+1) \cdot P(x+3) = x^3 + ax^2 + bx + 2$

$\Rightarrow$ **$P(3) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

15. $\text{der}[P(x) \cdot Q(x)] = 18$,

$\text{der}\left[\frac{P(x^2)}{Q(x)}\right] = 6$

$\Rightarrow$ **$\text{der}[P(x^2) \cdot Q(2x)] = ?$**

A) 20 B) 24 C) 26 D) 28 E) 30

16. $\text{der}[P(x)] = a$,

$\text{der}[Q(x)] = b$,

$\text{der}[P(x^2) \cdot Q(x^3)] = 17$ ve (and) $\text{der}\left[\frac{P(x^2)}{Q(x)}\right] = 5$

$\Rightarrow$ **a = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

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1	2	3	4	5	6	7	8
E	A	E	D	A	D	E	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	C	D	C	C	B	C	C

1. $P(x)=x^2-2x^3+3x-3 \Rightarrow \mathbf{P(1)+P(-1)=?}$

A) –4 B) –3 C) –2 D) –1 E) 0

2. $P(x)=5x^4-2x^3+x^2-8$

$\Rightarrow \mathbf{P(0)=?}$

A) 8 B) 4 C) 0 D) –4 E) –8

3. $P(x)=x^2+mx-3,\ P(-1)=4 \Rightarrow \mathbf{P(-2)=?}$

A) 6 B) 8 C) 9 D) 12 E) 13

4. $P(x+3)=x^4-2x^2+4x+1 \Rightarrow \mathbf{P(4)=?}$

A) 4 B) 5 C) 6 D) 7 E) 8

5. $P(x)=(m-2)x^3+2x^2+nx-5$

$Q(x)=5x^2-nx^2-ax-5$

$P(x)=Q(x) \Rightarrow \mathbf{m+n+2a=?}$

A) –3 B) –1 C) 0 D) 2 E) 6

6. $m,n\in R,$

$P(x)=x^2-2x+4,$

$Q(x)=(x+1)\cdot(x-m)+n,$

$P(x)=Q(x) \Rightarrow \mathbf{n=?}$

A) 3 B) 4 C) 5 D) 6 E) 7

7. $P(x^2)=2x^4-3x^2+4 \Rightarrow \mathbf{P(2)=?}$

A) 3 B) 5 C) 8 D) 6 E) 12

8. $P(x)=3x^{11}-4x^7+kx,$

$P(1)=0 \Rightarrow \mathbf{k=?}$

A) –11 B) 7 C) 3 D) 1 E) –5

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9. $Q(x) = 2x^2 - 5a + 2,$

$Q(2) = 0 \Rightarrow$ **a = ?**

A) 2 B) –3 C) 4 D) 5 E) –6

10. $P(x-3) = (x^2 + x - 2) \cdot Q(x+1),$

$P(1) = 9 \Rightarrow$ **Q(5) = ?**

A) – 2 B) –1 C) $\frac{1}{2}$ D) 1 E) $\frac{2}{3}$

11. $\frac{2x+2}{x^2-2x-8} = \frac{A}{x-4} + \frac{B}{x+2} \Rightarrow$ **A + B = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

12. $\frac{x+3}{(x+2)^2} = \frac{A}{x+2} + \frac{B}{(x+2)^2} \Rightarrow$ **A + B = ?**

A) –1 B) –2 C) 0 D) 1 E) 2

13. $P(x) + (x + 1) \cdot Q(x - 2) = x^2 - 4x - 8,$

$P(2) = 6 \Rightarrow$ **Q(0) = ?**

A) –5 B) –6 C) –7 D) –8 E) –9

14. $P(x + 3) = (2x^2 - 3) \cdot Q(x + 2) + x + 2,$

$Q(0) = 11 \Rightarrow$ **P(1) = ?**

A) 11 B) 22 C) 40 D) 55 E) 66

15. $P(2x-3) = 2x^3 - 3 \cdot Q(x-2) + 1,$

$P(1) = -4 \Rightarrow$ **Q(0) = ?**

A) 7 B) 9 C) 11 D) 13 E) 15

16. $P(2x+a) \cdot Q(x-1) = x^3 - 5x^2 + 18$ ve(and) $P(a) = 6$

$\Rightarrow$ **Q(–1) = ?**

A) 3 B) 4 C) 5 D) 6 E) 8

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1	2	3	4	5	6	7	8
A	E	E	A	B	E	D	D
9	10	11	12	13	14	15	16
A	C	A	E	B	D	A	A

1. $(x-2)\cdot P(x) = x^2 - 3x - a$

$\Rightarrow$ **P(2) = ?**

A) 1 B) –1 C) 2 D) –2 E) 0

2. $x^2 - 2x + a = (x + 1)\cdot P(x)$

$\Rightarrow$ **P(2) = ?**

A) –2 B) –1 C) 0 D) 4 E) 5

3. $P(x) = x^3 + 2x^2 - 2ax - 1$

$P(1) = 0 \Rightarrow$ **a = ?**

A) 1 B) 3 C) 5 D) 7 E) 9

4. $(x - 1)\cdot P(x) = ax^2 + 2x - b$,

$P(0) = 1$

$\Rightarrow$ **a + b = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

5. $(x - 3)\cdot P(x + 1) = Q(x + 2) + x^2 - x + m$

$P(0) = -2$, $Q(1) = 6 \Rightarrow$ **m = ?**

A) 3 B) 0 C) –1 D) –2 E) –4

6. $P(x) = (x^2 + 1)\cdot(5x - 2)\cdot(ax + b)$,

$P(0) = 4$, $P(1) = 6 \Rightarrow$ **a – b = ?**

A) 3 B) 4 C) 5 D) 6 E) 9

7. $P(x) = x^3 - ax + 3$,

$Q(x) = x^2 - 4x + a$,

$P(2) = Q(2) \Rightarrow$ **a = ?**

A) 3 B) 4 C) 5 D) 6 E) 9

8. $P(x) = 3x^4 - 5x^2 + (a - 3)x - b + 4$

$Q(x) = (c - 1)x^4 + (2d + 1)x^2 + 3$

$P(x) = Q(x) \Rightarrow$ **a + b – c + d = ?**

A) –3 B) –2 C) 0 D) 2 E) 3

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9. $P(x) = x^5 + ax^4 - 2x^3 + bx^2 + 7x - 2,$

$Q(x) = (cx^3 - x + 2) \cdot (x^2 + 3x - 1),$

$P(x) = Q(x) \Rightarrow$ **a + b + c = ?**

A) –2 B) –1 C) 1 D) 3 E) 5

10. $P(x-3) = x^2 - 6x + 10$

$\Rightarrow$ **P(x) = ?**

A) $x^2 - 3$ B) $x^2 - 2$ C) $x^2 - 1$ D) $x^2 + 1$ E) $x^2 + 16$

11. $P(3x-2) = 6x - 5 \Rightarrow$ **P(x + 1) = ?**

A) 2x – 2 B) 2x – 1 C) 2x D) 2x+1 E) 2x+2

12. $P(1-x) = x^2 + x - 2 \Rightarrow$ **P(x + 1) = ?**

A) $x^2 - x + 1$ B) $x^2 + x + 1$ C) $x^2 - x - 2$ D) $x^2 - 2x - 3$ E) $x^2 + x + 3$

13. $P(x+2) = (x^2 - x) \cdot Q(x),$

$Q(-1) = 2 \Rightarrow$ **P(1) = ?**

A) 4 B) 6 C) 8 D) 10 E) 12

14. $P(x-2) + P(x+2) = 8x + 6$

$\Rightarrow$ **P(x) = ?**

A) 4x B) 6x C) 3 D) 4x + 3 E) 6x + 3

15. $a \cdot P(2x-1) = \dfrac{P(x+2)}{Q(x-1)},$

$P(4) = 5 \cdot P(3),$

$Q(1) = \dfrac{3}{4} \Rightarrow$ **a = ?**

A) $\dfrac{4}{5}$ B) $\dfrac{20}{3}$ C) 7 D) $\dfrac{25}{3}$ E) $\dfrac{20}{7}$

16. $P(x) = x^3 + 3x^2 + 3x + 2$

$\Rightarrow$ **P($\sqrt[3]{2} - 1$) = ?**

A) 0 B) 2 C) 3 D) 7 E) –9

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1	2	3	4	5	6	7	8
A	B	A	E	B	C	C	A
9	10	11	12	13	14	15	16
D	D	D	C	A	D	B	C

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1. $P(x)=(x^2+1)\cdot Q(x)+4,$
$P(1)=10,\ Q(0)=5$
$\Rightarrow$ **P(0) + Q(1) = ?**

A) 3 B) 6 C) 9 D) 12 E) 15

2. $Q(x+1)=(2x^2+3)\cdot P(x+2)-1$
$Q(0)=-16$
$\Rightarrow$ **P(1) = ?**

A) –5 B) –3 C) –1 D) 3 E) 5

3. $P(x)=x\cdot Q(x)+2x-1$
$\Rightarrow \mathbf{\dfrac{P(3)-5}{Q(3)}=?}$

A) 3 B) 5 C) 6 D) 9 E) 10

4. $\dfrac{P(x+3)+x^2}{x-2}=(x^3-1)\cdot Q(x)+4$
$P(2)=5 \Rightarrow$ **Q(−1) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $P(x)=ax^2+bx+c$
$Q(x)=(x-2)\cdot(x-3)$
$P(x)=Q(x) \Rightarrow$ **a + b + c = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

6. $P(x)=(a-3)x^2+(b-2)x^3+(c^2-4)x^5$
$Q(x)=(d-1)x+(2a-6)x^2+2x^3+(c-2)x^4$
$P(x)=Q(x) \Rightarrow$ **a + b + c + d = ?**

A) 8 B) 10 C) 12 D) 14 E) 16

7. $\dfrac{5-2x}{x^2-5x+6}=\dfrac{A}{x-3}+\dfrac{B}{x-2} \Rightarrow$ **2A + B = ?**

A) –3 B) –1 C) 0 D) 1 E) 3

8. $\dfrac{2x+3}{2x^2-x-1}=\dfrac{A}{x-1}+\dfrac{B}{2x+1} \Rightarrow$ **A + B = ?**

A) $-\frac{2}{3}$ B) $-\frac{1}{3}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{5}{3}$

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9. $P(x^3-1) = Q(x^3+1) \cdot (x^6+12)$,

$Q(4) = 3 \Rightarrow$ **$P(2) = ?$**

A) 9 B) 21 C) 36 D) 54 E) 63

10. $(3x-2) \cdot P(x-2) - x \cdot P(x-3) = x^2+6x$

$P(0) = 5 \Rightarrow$ **$P(-1) = ?$**

A) 0 B) 1 C) 2 D) 3 E) 4

11. $(x^2-4) \cdot P(x) = x^3-2x^2+ax+b$

$\Rightarrow$ **$b = ?$**

A) 2 B) 4 C) 6 D) 8 E) 10

12. $(x^3+6) \cdot P(x) + 6x = ax^3+2ax+b+3$

$\Rightarrow$ **$b = ?$**

A) 3 B) 5 C) 8 D) 10 E) 15

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13. $P(x) + 2 \cdot P(-x) = -4x+6 \Rightarrow$ **$P(2) = ?$**

A) – 30 B) – 10 C) 0 D) 10 E) 30

14. $P(x) + P(x+2) = 2x^2+4x+2$

$\Rightarrow$ **$P(x) = ?$**

A) x^2-1 B) x^2-2 C) x^2-4

D) x^2-x-1 E) x^2-2x-1

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1	2	3	4	5	6	7
D	B	A	C	A	B	A
8	**9**	**10**	**11**	**12**	**13**	**14**
C	E	C	D	E	D	A

1. $P(x) = x^2 + x + 3,$

$Q(x) = x - 1$

$\Rightarrow$ **$P(x) \cdot Q(x) = ?$**

A) $x^3 - x^2 + 2x - 3$
B) $x^3 - x + 3$
C) $x^3 + 2x - 3$
D) $x^3 - 3$
E) $x^3 + 4x - 3$

2. $(x^2 - x + 2) \cdot (x^2 - 2x + 1) = x^4 + Ax^3 + Bx^2 + Cx + D$

$\Rightarrow$ **A = ?**

A) –1 B) –2 C) –3 D) –4 E) –7

3. $x^3 + ax^2 + bx + c = (x+1) \cdot (x-2) \cdot (x+3)$

$\Rightarrow$ **a + b + c = ?**

A) –9 B) –13 C) –3 D) –1 E) 13

4. $P(x) = x^3 + 2,$

$Q(x) = x^4 - x - 1,$

$P(x) \cdot Q(x) = a_7x^7 + a_6x^6 + a_5x^5 + \ldots + a_1x + a_0$

$\Rightarrow$ **$a_1 = ?$**

A) –2 B) –1 C) 0 D) 1 E) 2

5. $ax^3 + bx^2 + cx + d = (4x - 2) \cdot (x - 2)^2$

$\Rightarrow$ **a + b + c + d = ?**

A) –6 B) –4 C) 2 D) 4 E) 6

6. $P(x) = x^2 - x + 3,$

$$\begin{array}{r|l} P(x) & x-1 \\ \hline -\ \ \ K(x) & \end{array} \Rightarrow \textbf{K(x)=?}$$

A) 1 B) 2 C) 3 D) 4 E) 5

7. $P(x) = x^3 - 2x^2 + 3x + a - 4$

$$\begin{array}{r|l} P(x) & x-2 \\ \hline -\ \ \ 0 & \end{array} \Rightarrow \textbf{P(1) = ?}$$

A) –2 B) –3 C) –4 D) –5 E) –6

8. $P(2x-1) = x^3 - 3x^2 + x + m,$

$$\begin{array}{r|l} P(x) & x+3 \\ \hline -\ \ \ 2 & \end{array} \Rightarrow \textbf{m = ?}$$

A) 7 B) 6 C) 2 D) 0 E) –2

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9. $P(x) = 3x^3 + 6x^2 + x + 4$

$$\begin{array}{r|l} P(2x-1) & 2x+1 \\ \hline \underline{\quad} & \\ K(x) & \end{array} \Rightarrow \mathbf{K(x) = ?}$$

A) –4 B) –2 C) 0 D) 2 E) 4

10. $P(x + 2) = x^2 - 3x + 5$

$Q(x) = (x + 1)\cdot P(x + 3) + 3\cdot P(2x + 1)$

$$\begin{array}{r|l} Q(x) & x-1 \\ \hline \underline{\quad} & \\ K(x) & \end{array} \Rightarrow \mathbf{K(x) = ?}$$

A) 11 B) 12 C) 13 D) 14 E) 15

11. $P(x) = x^6 + 3ax^4 - b$

$$\begin{array}{r|l} P(x) & x^3-2 \\ \hline \underline{\quad} & \\ 12x+5 & \end{array} \Rightarrow \mathbf{a-b = ?}$$

A) 1 B) 2 C) 3 D) 4 E) 5

12. $P(x) = 3x^5 - 2x^4 + ax^3 + bx^2 - 1$

$$\begin{array}{r|l} P(x) & x^2-1 \\ \hline \underline{\quad} & \\ 0 & \end{array} \Rightarrow \mathbf{a\cdot b = ?}$$

A) –9 B) –6 C) –3 D) 3 E) 9

13. $P(x) = x^{15} - x^{10} + x^5 - 2$

$$\begin{array}{r|l} P(x) & x^5+1 \\ \hline \underline{\quad} & \\ t & \end{array} \Rightarrow \mathbf{t = ?}$$

A) –6 B) –5 C) –4 D) –3 E) –2

14. $P(x) = 2x^4 - 3x^3 + (a - b)x + 3a + b,$

$$\begin{array}{r|l} P(x) & x^2+1 \\ \hline \underline{\quad} & \\ 5x+6 & \end{array} \Rightarrow \mathbf{a = ?}$$

A) 6 B) 4 C) $\frac{3}{2}$ D) $\frac{2}{3}$ E) $\frac{1}{2}$

15. $P(x) = x^3 + 3x^2 + 3x + m$

$$\begin{array}{r|l} P(x) & x-\sqrt[3]{5}+1 \\ \hline \underline{\quad} & \\ 0 & \end{array} \Rightarrow \mathbf{m = ?}$$

A) –6 B) –5 C) –4 D) –3 E) –2

16.

$$\begin{array}{r|l} P(x) & x+3 \\ \hline \underline{\quad} & \\ 5 & \end{array}$$

$(x + 1)\cdot P(x) = x^3 - ax^2 + b \Rightarrow \mathbf{a + b = ?}$

A) –5 B) –3 C) –2 D) 1 E) 0

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1	2	3	4	5	6	7	8
C	C	A	A	C	C	C	A
9	10	11	12	13	14	15	16
D	E	C	A	B	C	C	B

1. $P(x) + P(2x) = 12x + 6 \Rightarrow$ **P(3) = ?**

A) 10 B) 15 C) 20 D) 36 E) 42

2. $x \cdot P(x) - P(x) = 2x^2 + 2x - 4$

$\Rightarrow$ **P(x − 1) = ?**

A) $2x - 2$ B) $-2x + 2$ C) $x - 4$ D) $2x + 2$ E) $2x + 4$

3. $P(3x) + 4 \cdot P(-3x) = 25x$

$\Rightarrow$ **P(1) + P(−1) = ?**

A) −1 B) $-\frac{1}{3}$ C) 0 D) $\frac{1}{3}$ E) 1

4. $P(3x-4) = x^4 + 2x^2 - 1$

$P(x+2)$ divided by $x+3$, remainder k $\Rightarrow$ **k = ?**

A) −4 B) −2 C) 1 D) 2 E) 4

5. $P(5x+1) = 3x^2 - 7x + 10$

$P(2x-3)$ divided by $x-2$, remainder k $\Rightarrow$ **k = ?**

A) 8 B) 10 C) 12 D) 14 E) 16

6. $P(3x+1) = x^3 - 5x^2 + 4x + 6$

$P(x+1)$ divided by $x+3$, remainder k $\Rightarrow$ **k = ?**

A) −6 B) −4 C) −2 D) 4 E) 6

7. $P(x) = x^6 - 2x^4 + 3x^2 - 1$

$P(x)$ divided by $x - \sqrt{3}$, remainder k $\Rightarrow$ **k = ?**

A) 15 B) 17 C) 24 D) 27 E) 39

8. $P(4x+1) + P(3x) + 6 = 0$

$P(x)$ divided by $x+3$, remainder k $\Rightarrow$ **k = ?**

A) −3 B) −2 C) −1 D) 2 E) 3

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9. $P(x^4+1) = x^8 - 3x^4 + 5$

$P(x)$ divided by $x-2$, remainder k $\Rightarrow$ **k = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

10. $P(x)$ divided by x^2-2x, remainder $3x-1$; $P(x)$ divided by $x-2$, remainder k $\Rightarrow$ **k = ?**

A) 1 B) 3 C) 5 D) 7 E) 9

11. $P(x) = 3x^3 + ax + b$

$P(x)$ divided by x^2-x-1, remainder 0 $\Rightarrow$ **a·b = ?**

A) 3 B) 6 C) 9 D) 12 E) 18

12. $P(x) = x^9 + 2x^8 + x^6 + n$

$P(x)$ divided by x^3+2, remainder nx^2+m $\Rightarrow$ **m = ?**

A) –8 B) –4 C) 0 D) 4 E) 8

13. $P(x)$ divided by $x-a$, remainder 1; $P(x)$ divided by $(x-1)\cdot(x-a)$, remainder $-2x+5$ $\Rightarrow$ **a = ?**

A) 8 B) 6 C) 4 D) 2 E) 0

14. $\left.\begin{array}{l} P(0)=5 \\ P(1)=9 \end{array}\right\} \Rightarrow$ $P(x)$ divided by x^2-x-1, remainder **k = ?**

A) 4x B) 4x+1 C) –4x–1 D) 4x+3 E) 4x+5

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1	2	3	4	5	6	7
B	D	C	D	B	B	B
8	**9**	**10**	**11**	**12**	**13**	**14**
A	C	C	E	D	D	E

1. $\begin{array}{r|l} P(x) & x-2 \\ \cline{2-2} & Q(x) \\ 4 & \end{array} \Rightarrow \mathbf{P(1) + Q(1) = ?}$

A) 0 B) 1 C) 2 D) 3 E) 4

2. $P(x) = 2x^3 + 3x^2 + 4x + 5,$

$\begin{array}{r|l} P(x) & x+1 \\ \cline{2-2} & Q(x) \\ m & \end{array} \Rightarrow \mathbf{m = ?}$

A) 4 B) 3 C) 2 D) 1 E) 0

3. $P(x) = 4x^3 + 5x^2 + 3mx - 3,$

$\begin{array}{r|l} P(x) & x-1 \\ \cline{2-2} & Q(x) \\ 0 & \end{array} \Rightarrow \mathbf{m = ?}$

A) –5 B) –4 C) –3 D) –2 E) –1

4. $\dfrac{3x + P(x-6)}{Q(x+1)} = x - 5 \Rightarrow \begin{array}{r|l} \mathbf{P(x)} & \mathbf{x+1} \\ \cline{2-2} \mathbf{?} & \end{array}$

A) –15 B) –10 C) –5 D) 10 E) 5

5. $P(x-1) = -x^3 + 2x^2 + ax - 3,$

$2 \cdot P(x) + 5 = Q(x),$

$\begin{array}{r|l} Q(x) & x+2 \\ \cline{2-2} -1 & \end{array} \Rightarrow \mathbf{a = ?}$

A) 1 B) 5 C) 6 D) 3 E) 8

6. $P(x) = x^8 - 4x^6 - 3x^5 - 2x^3 + 10$

$\Rightarrow \begin{array}{r|l} \mathbf{P(x)} & \mathbf{x^2} \\ \cline{2-2} \mathbf{?} & \end{array}$

A) 6 B) 4 C) 2 D) 10 E) –2

7. $\begin{array}{r|l} P(x) & x^2 - 2x \\ \cline{2-2} 3x - 2 & \end{array} \Rightarrow \mathbf{P(0) = ?}$

A) –2 B) –1 C) 0 D) 1 E) 2

8. $P(x) = x^3 + ax^2 + bx + 1,$

$\begin{array}{r|l} P(x) & x^2 - x + 1 \\ \cline{2-2} 0 & \end{array} \Rightarrow \mathbf{a + b = ?}$

A) $-\frac{5}{2}$ B) –2 C) 0 D) $\frac{1}{3}$ E) – 1

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9. $P(x) = ax^4 + bx^2 + 1,$

$P(x)$ divided by $(x-1)^2$ leaves remainder 0 $\Rightarrow$ **b = ?**

A) –2 B) –1 C) 1 D) 3 E) 4

10. $P(x) = 2x^3 - ax + b,$

$P(x)$ divided by $(x-1)^2$ leaves remainder 0 $\Rightarrow$ **a·b = ?**

A) 10 B) 14 C) 20 D) 24 E) 30

11. $P(x)$ divided by $x+1$ leaves remainder 1, $P(x)$ divided by $x-1$ leaves remainder 5

$\Rightarrow$ **$P(x)$ divided by x^2-1 leaves remainder ?**

A) $2x-3$ B) $2x+3$ C) $3-2x$ D) $x+3$ E) $2x+2$

12. $P(x)$ divided by $x+4$ leaves remainder –19, $P(x)$ divided by $x-5$ leaves remainder –1

$\Rightarrow$ **$P(x)$ divided by x^2-x-20 leaves remainder ?**

A) $-2x-11$ B) $-2x+11$ C) $2x-11$ D) $2x+11$ E) $-x-11$

13. $P(2x-6) = (x^2-4x-5)\cdot T(x-2) + x^2 + 2x + 6,$

$T(1) = 4 \Rightarrow$ **$P(0) = ?$**

A) –15 B) –13 C) –12 D) –11 E) –10

14. $P(x-2)$ divided by $x-1$ leaves remainder 2, $P(x-2)$ divided by $x+1$ leaves remainder 4

$\Rightarrow$ **$P(x)$ divided by x^2+4x+3 leaves remainder ?**

A) 8 B) $-x+1$ C) $-x-1$ D) $x+4$ E) $x+5$

15. $P(x+2) = (3x^2+ax)\cdot Q(x-1) + 5,$

$Q(1) = 4,$

$P(x)$ divided by $x-4$ leaves remainder 5 $\Rightarrow$ **a = ?**

A) –7 B) –5 C) –6 D) –8 E) –10

16. $\dfrac{P(x-7)}{Q(x+1)} = x^2 - x + 3,$

$Q(x)$ divided by $x-1$ leaves remainder 3, $P(x)$ divided by $x+7$ leaves remainder k $\Rightarrow$ **k = ?**

A) 9 B) –9 C) 6 D) –6 E) 3

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1	2	3	4	5	6	7	8
E	C	D	A	D	D	A	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	D	B	C	D	B	C	A

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1. $P(x+2) = x^2 - 3x + 5$

$\begin{array}{c|c} P(x-1) & x-4 \\ \hline m & \end{array} \Rightarrow$ **m = ?**

A) 2 B) 3 C) 5 D) 6 E) 9

2. $Q(x) = x^3 - x^2 + 3x + n,$

$\begin{array}{c|c} Q(x+1) & x-2 \\ \hline 0 & \end{array} \Rightarrow$ **n = ?**

A) −27 B) −15 C) −10 D) 10 E) 27

3. $\begin{array}{c|c} P(x) & x-1 \\ \hline -2 & \end{array}$ $\begin{array}{c|c} P(x) & x+1 \\ \hline 4 & \end{array} \Rightarrow$ $\begin{array}{c|c} \mathbf{P(x)} & \mathbf{x^2-1} \\ \hline \mathbf{?} & \end{array}$

A) −2 B) 1 C) −3 D) −3x + 1 E) 3x +1

4. $\begin{array}{c|c} P(x) & x-1 \\ \hline 0 & \end{array}$ $\begin{array}{c|c} P(x) & x+1 \\ \hline 0 & \end{array}$ $\begin{array}{c|c} P(x) & x+2 \\ \hline 0 & \end{array}$

$P(3) = 40 \Rightarrow$ **P(0) = ?**

A) −5 B) −4 C) −3 D) −2 E) −1

5. $\begin{array}{c|c} P(x) & x^3-1 \\ \hline x^2+3x-1 & \end{array} \Rightarrow$ $\begin{array}{c|c} \mathbf{P(x)} & \mathbf{x-1} \\ \hline \mathbf{?} & \end{array}$

A) 1 B) 2 C) 3 D) 4 E) 5

6. $\begin{array}{c|c} P(x) & x-2 \\ \hline 6 & \end{array}$ $\begin{array}{c|c} P(x) & (x-2)\cdot(x-1) \\ \hline 2x+a & \end{array}$

$\Rightarrow$ $\begin{array}{c|c} \mathbf{P(x)} & \mathbf{x-1} \\ \hline \mathbf{?} & \end{array}$

A) −4 B) −1 C) 1 D) 2 E) 4

7. $\begin{array}{c|c} P(x) & x^2-5x+4 \\ \hline 2x+3 & \end{array}$ $\begin{array}{c|c} P(x) & x-4 \\ \hline K(x) & \end{array} \Rightarrow$ **K(x) = ?**

A) 5 B) 7 C) 8 D) 10 E) 11

8. $P(2) = 5,\ Q(1) = 3,$

$\begin{array}{c|c} P(x+4)\cdot Q(x+3) & x+2 \\ \hline K(x) & \end{array} \Rightarrow$ **K(x)=?**

A) 3 B) 5 C) 8 D) 12 E) 15

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9. $\dfrac{P(x-1)}{Q(x-4)} = -x^3 + 3x^2 + 5x + 3$

$\begin{array}{r|l} P(x) & x-3 \\ \hline -7 & \end{array}$ $\qquad$ $\begin{array}{r|l} Q(x) & x \\ \hline K(x) & \end{array}$ $\qquad \Rightarrow$ **K (x) = ?**

A) –3 B) –1 C) 0 D) 1 E) 3

10. $P(x+2) = (x^2 - 3x + 5) \cdot Q(x+2) + x + 4$

$\begin{array}{r|l} Q(x) & x \\ \hline 3 & \end{array}$ $\qquad$ $\begin{array}{r|l} P(x) & x \\ \hline K(x) & \end{array}$ $\qquad \Rightarrow$ **K (x) = ?**

A) 43 B) 45 C) 47 D) 49 E) 51

11. $\begin{array}{r|l} P(x) & x-1 \\ \hline 2 & Q(x) \end{array}$ $\qquad$ $\begin{array}{r|l} Q(x) & x+2 \\ \hline 3 & \end{array}$

$\Rightarrow$ $\begin{array}{r|l} \mathbf{P(x)} & \mathbf{x^2 + x - 2} \\ \hline \mathbf{?} & \end{array}$

A) 1 – 3x B) 3 – x C) 3x – 1 D) 3x + 1 E) x – 3

12. $P(x) = x^5$,

$\begin{array}{r|l} P(x) & x^2 + x + 1 \\ \hline K(x) & \end{array}$ $\qquad \Rightarrow$ **K (x) = ?**

A) x B) –x + 1 C) x – 1 D) x + 1 E) – x – 1

13. $\begin{array}{r|l} 8x^4 + 6x^3 - 5x^2 - 6x + m & x^2 - 1 \\ \hline 0 & B(x) \end{array}$

$\Rightarrow$ **m=?**

A) –2 B) –3 C) –4 D) –5 E) –6

14. $\dfrac{P(3x-3)}{Q(3x-4)} = 3x^2 - 4x - 5$

$\begin{array}{r|l} Q(x) & x-2 \\ \hline 7 & \end{array}$ $\qquad$ $\begin{array}{r|l} P(x) & x-3 \\ \hline K(x) & \end{array}$ $\qquad \Rightarrow$ **K (x) = ?**

A) –9 B) –7 C) –5 D) –3 E) –1

15. $\begin{array}{r|l} P(x) & (x+2)^2 \\ \hline 2x+1 & \end{array}$ $\Rightarrow$ $\begin{array}{r|l} \mathbf{P^2(x)} & \mathbf{(x+2)^2} \\ \hline \mathbf{?} & \end{array}$

A) $-12x + 17$ B) $12x + 15$ C) $-12x - 15$ D) $-12x + 15$ E) $4x + 15$

16. $(x-2) \cdot P(x) = x^4 - 2x^3 + ax + 6$,

$\begin{array}{r|l} P(x) & x+2 \\ \hline k & \end{array}$ $\qquad \Rightarrow$ **k = ?**

A) –9 B) 10 C) –11 D) 12 E) –13

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1	2	3	4	5	6	7	8
B	A	D	D	C	E	E	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	C	C	E	B	B	C	C

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1. $P(x) = x^3 + 2x^2 - 3x + 4,$

$\Rightarrow$ P(x) bölü $x + 2$ işleminde kalan = ?

A) 10 B) –6 C) 0 D) 6 E) –10

2. $P(x) = x^{10} - mx^5 + n - 1,$

P(x) bölü $x^5 + 1$ işleminde kalan = 0 $\Rightarrow m + n = ?$

A) 5 B) –5 C) 0 D) –10 E) 10

3. $P(x) = x^3 + ax^2 - 5x + 6,$

P(x) bölü $x^2 + x$ işleminde kalan = $5x + 6$ $\Rightarrow a = ?$

A) –10 B) –9 C) –8 D) –7 E) –6

4. $P(x) = x^3 + nx^2 + mx - 2,$

P(x) bölü $x^2 - x - 2$ işleminde kalan = 0 $\Rightarrow m + n = ?$

A) –5 B) –3 C) –2 D) 1 E) 5

5. $P(x) = x^5 + ax - b,$

P(x) bölü $x^2 - 1$ işleminde kalan = $5x - 3$ $\Rightarrow a \cdot b = ?$

A) 6 B) 12 C) 18 D) 24 E) 36

6. $P(x) = ax^2 + bx + c,$

$P(-1) = P(2) = 6,$

P(x) bölü $x - 3$ işleminde kalan = 22 $\Rightarrow P(1) = ?$

A) –6 B) 6 C) –3 D) 3 E) –2

7. $P(x) = ax^2 + bx + c,$

$P(5) = P(-2) = 18,$

$P(1) = -6,$

P(x) bölü $x + 3$ işleminde kalan = k $\Rightarrow k = ?$

A) 30 B) 34 C) 38 D) 42 E) 46

8. $(x - 1) \cdot P(x - 1) = 4x^3 + ax^2 + 3x - 1,$

P(x) bölü $x - 2$ işleminde kalan = k $\Rightarrow k = ?$

A) 11 B) 21 C) 31 D) 41 E) 51

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9. $x \cdot P(2x+1) + (x^2-4) \cdot Q(x) = x^2 - 3x + 4$

$\begin{array}{r|l} P(x) & x-5 \\ \hline & \\ k & \end{array} \Rightarrow$ **k = ?**

A) 1 B) 3 C) 5 D) 7 E) 9

10. $\begin{array}{r|l} P(x) & x^2+3x-10 \\ \hline & \\ 7x+3 & \end{array}$ $\begin{array}{r|l} P(x) & x-2 \\ \hline & \\ k & \end{array} \Rightarrow$ **k = ?**

A) 13 B) 15 C) 17 D) 19 E) 23

11. $\begin{array}{r|l} P(x) & x^2+1 \\ \hline & Q(x) \\ x+2 & \end{array}$ $\begin{array}{r|l} Q(x) & x-1 \\ \hline & \\ 4 & \end{array}$

$\Rightarrow$ **P (1) = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

12. $P(x+3) = 7 \cdot Q(x+1) + 2x + 3$

$\begin{array}{r|l} P(x) & x-2 \\ \hline & \\ 8 & \end{array}$ $\begin{array}{r|l} Q(x) & x \\ \hline & \\ k & \end{array} \Rightarrow$ **k = ?**

A) 12 B) 7 C) 3 D) 2 E) 1

13. $P(x-4) = 3 \cdot Q(x) + 7x + 4$

$\begin{array}{r|l} P(x) & x-2 \\ \hline & \\ 4 & \end{array}$ $\begin{array}{r|l} Q(x) & x-6 \\ \hline & \\ k & \end{array} \Rightarrow$ **k = ?**

A) 14 B) 7 C) 0 D) –7 E) –14

14. $(x-2) \cdot P(x) = x^4 - 6x^3 + 14x^2 + (3a-2)x + 16$

$\begin{array}{r|l} P(x) & x+2 \\ \hline & \\ k & \end{array} \Rightarrow$ **k = ?**

A) –11 B) –22 C) –44 D) –66 E) –88

15. $\begin{array}{r|l} P(x) & (x-3)^2 \cdot (x+3) \\ \hline & \\ x^2-2x-6 & \end{array}$

$\begin{array}{r|l} P(x) & x^2-9 \\ \hline & \\ mx+n & \end{array} \Rightarrow$ **m·n=?**

A) –9 B) 9 C) –6 D) 6 E) –3

16. $P(x) = (x+1) \cdot Q(x) + 3$,

$Q(x) = (x-1) \cdot T(x) - 2$,

$\begin{array}{r|l} P(x) & x^2-1 \\ \hline & \\ mx+n & \end{array} \Rightarrow$ **m – n= ?**

A) –5 B) –4 C) –3 D) –2 E) –1

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	C	B	B	B	E	B	C
9	10	11	12	13	14	15	16
A	C	B	E	E	C	C	C

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1. $n \in Z^+$,
$P(x) = x^{3n} - 3x^{2n} + 3x^n - 10$,

$$\begin{array}{c|l} P(x) & x^n - \sqrt[3]{6} - 1 \\ \hline - \\ k & \end{array} \Rightarrow \textbf{k = ?}$$

A) –5 B) –4 C) –3 D) –2 E) 0

2. $P\left(\frac{5}{x}\right) + 2 \cdot P\left(\frac{x}{5}\right) = 2x - 1 \Rightarrow \textbf{P(2) = ?}$

A) 7 B) $\frac{28}{3}$ C) $\frac{32}{3}$ D) $\frac{34}{3}$ E) –8

3. $P(x) = x^6 + ax^5 + bx^4 + cx^3 + dx^2 + ex + f$,
$P(1) = P(2) = P(3) = P(4) = P(5) = P(6) = 0$
$\Rightarrow$ **a = ?**

A) –30 B) –25 C) –21 D) –15 E) –10

4. $P(x) = x^3 + bx^2 + cx + d$,
$P(-1) = P(1) = P(2) = 4$,

$$\begin{array}{c|l} P(x) & x + 2 \\ \hline - \\ k(x) & \end{array} \Rightarrow \textbf{k(x) = ?}$$

A) –12 B) 10 C) –8 D) –4 E) 0

5. $a, b \in Z^+$,
$P(x) = (x-2)^{2a+3} + 25 \cdot (x+8)^b$,
$P(-3) = 0 \Rightarrow \textbf{b = ?}$

A) 2a B) 2a + 1 C) 2a – 1 D) $\frac{a}{2}$ E) $\frac{a+1}{2}$

6. $P(2x) + P(4x) + P(16x) + P(8x) = 60x + 20$
$\Rightarrow \textbf{P(1) = ?}$

A) 10 B) 8 C) 7 D) 5 E) 2

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7. $P(x+1)+P(x-1)=2x^2-8x+18$

$\Rightarrow$ **$P(1)=?$**

A) 4 B) 5 C) 6 D) 7 E) 8

8. $P(x)=x^3+6x^2-x-6$,

$P(x)=0,\ x\in Z \Rightarrow \sum x=?$

A) –8 B) –7 C) –6 D) –5 E) –4

9. $P(x)=x^4-9x^2-x+3$,

$P(x)=0,\ x\in Z \Rightarrow \sum x=?$

A) 6 B) 5 C) 4 D) 3 E) 2

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10. $P(x)=x^5-2x^4-2x^3+2x^2+x$,

$P(x)=0,\ x\in Z \Rightarrow \prod x=?$

A) 0 B) –1 C) –2 D) 2 E) 3

11. $k\in Z$,

$P(x^5+k)=x^{10}+6x^5+4$,

$P(x+k)$ divided by $x-k$, remainder -5 $\Rightarrow$ **k=?**

A) –3 B) –2 C) –1 D) 2 E) 3

12. $x^2+6\cdot P(x)+5x+a=x\cdot P(x)$,

$P(x+1)$ divided by $x-2$, remainder $k(x)$ $\Rightarrow$ **k(x)=?**

A) 9 B) 11 C) 14 D) 15 E) 16

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
C	D	C	C	B	C	B	C	D	A	A	C

1. $P(x) = x^3 - mx^2 + mx - n + 3$, $P(x) = (x^2 - 4) \cdot B(x)$ $\Rightarrow$ **n − m = ?**

A) −4 B) 0 C) 19 D) 20 E) 23

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

2. $6x^4 + 8x^3 - 7x^2 - 4x - m$ divided by $2x^2 - 1$, quotient $B(x)$, remainder 0 $\Rightarrow$ **m = ?**

A) 0 B) 1 C) −2 D) −1 E) 2

[FIRAT ÜNİVERSİTESİ – YÖS 2018]

3. $P(x) = (x-1) \cdot (x-2) \cdot (x-4)$

$P(x+1)$ divided by $x+2$, quotient $B(x)$, remainder k $\Rightarrow$ **k = ?**

A) 5 B) 13 C) −11 D) −18 E) −30

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

4. $P(x) = (x-2) \cdot (x-3) \cdot B(x) + ax + b$,

$P(2) = 5$, $P(3) = 8$ $\Rightarrow$ **a · b = ?**

A) −3 B) −2 C) −1 D) 2 E) 3

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

5. $P(x) = (x^2 - 1) \cdot Q(x) + 4x + 5$,

$P(x) = (x-1) \cdot K(x) + R$

$\Rightarrow$ **R = ?**

A) 7 B) 8 C) 9 D) 10 E) 11

[ANKARA ÜNİVERSİTESİ – YÖS 2013]

6. $P\left(\frac{3x+7}{5}\right) = x^3 - 4x + 2ax - 5$

$P(2) = 0$ $\Rightarrow$ **a = ?**

A) −3 B) −2 C) 1 D) 2 E) 4

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

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7. $P(x) = 2x^7 - 3x^3 + 4x^2 + mx$

$P(-1) = 0 \Rightarrow$ **m = ?**

A) –5 B) –3 C) 0 D) 3 E) 5

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

8. **$P(x) = 2x^3 + 7x^2 + mx - 10$ polinomu $Q(x) = 2x + 5$ polinomuna tam bölünebiliyorsa m nedir?**

If $P(x) = 2x^3 + 7x^2 + mx - 10$ is divisible by $Q(x) = 2x + 5$, what the value of m ?

A) –1 B) 0 C) 1 D) 2 E) 3

[SÜLEYMAN DEMİREL ÜNİVERSİTESİ – YÖS 2014]

9. $P(x) = 4x^2 - x + 12$

$$\Rightarrow \begin{array}{r|l} P(3x+1) & x+2 \\ - \quad & \\ \hline ? & \end{array}$$

A) 110 B) 112 C) 117 D) 121 E) 125

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

10. $x^3 + 3x^2 + 6x + 3 = (x^2 + x + 1) \cdot (x + a) + bx + c$

$\Rightarrow$ **c = ?**

A) –2 B) 0 C) 1 D) 3 E) 5

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

11. $P(x) = 7x^3 - 2x^2 + 3x + 5$

$Q(x) = x^3 - x^2$

$P(x) \cdot Q(x) = a_6 \cdot x^6 + a_5 \cdot x^5 + a_4 \cdot x^4 + ... + a_1 \cdot x + a_0$

$\Rightarrow$ **a_5 = ?**

A) –9 B) –6 C) 3 D) 6 E) 9

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

12. $A = 3x^3 + 2x^2 + ax - 1$

$B = 2x^3 - (2a + 1)x^2 + 4x + 1$

$A \cdot B = ... + 2x^4 + ...$

$\Rightarrow$ **a = ?**

A) –2 B) –1 C) 2 D) 4 E) 5

[İSTANBUL ÜNİVERSİTESİ – YÖS 2014]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
E	C	E	A	C	E	E	C	C	C	A	D

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BÖLÜM
CHAPTER 2

TARİHSEL NOT / HISTORICAL NOTE

MERYEM MİRZAKHANİ [1977 – 2017]

2008'den bu yana Stanford Üniversitesi'nde matematik profesörü olarak çalışan MİRZAKHANİ, 2014 yılında "Matematiğin Nobeli " sayılan Fields madalyasını alarak bu ödülü kazanan ilk kadın olmuştur. Çalışmalarında özellikle hiperbolik geometri, ergodik teori, simplektik geometri ve Teichmüller teorisine odaklanmaktadır.

MIRZAKHANI, who had been working as a professor of mathematics at Stanford University since 2008, has awarded the Fields Medal as the Nobel Prize in Mathematics in 2014 and became the first woman to win this award. She focused on hyperbolic geometry, ergodic theory, symplectic geometry and Teichmüller theory in her works.

İKİNCİ DERECEDEN DENKLEMLER
QUADRATIC EQUATIONS

Bu bölüm 80 alıştırma sorusu, 156 test sorusu, 12 YÖS Sorusu içermektedir.

This chapter includes 80 exercise questions, 156 test questions, and 12 YÖS questions.

BÖLÜM / CHAPTER 2

İKİNCİ DERECEDEN DENKLEMLER / QUADRATIC EQUATIONS

- İkinci Dereceden Denklemler / Quadratic Equations .... 37 – 68

BÖLÜM 02 CHAPTER

İKİNCİ DERECEDEN DENKLEMLER
QUADRATIC EQUATIONS

1. $x^2 = 4 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{-2, 2\}$

2. $3x^2 - 9 = 0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{-\sqrt{3}, \sqrt{3}\}$

3. $10 - x^2 = 0 \Rightarrow$ ÇK(SS = ?)

Yanıt / The Answer is $\{-\sqrt{10}, \sqrt{10}\}$

4. $2x^2 + 10x = 0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{-5, 0\}$

5. $3x^2 + 1 = 0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\varnothing$

6. $x^2 + x - 6 = 0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{-3, 2\}$

7. $x^2 + 6x + 9 = 0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{-3\}$

8. $x^2 + x - 1 = 0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\left\{\frac{-1-\sqrt{5}}{2}, \frac{-1+\sqrt{5}}{2}\right\}$

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9. $x^2-2x-1=0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{1-\sqrt{2},\ 1+\sqrt{2}\}$

10. $x^2+2x-35=0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{-7,\ 5\}$

11. $2x^2+x-1=0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\left\{-1, \frac{1}{2}\right\}$

12. $3x^2+8x-3=0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\left\{-3, \frac{1}{3}\right\}$

13. $x^2+4x-1=0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\left\{-2-\sqrt{5}, -2+\sqrt{5}\right\}$

14. $\dfrac{x^2-6x-16}{x^2-3x-10}=0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{8\}$

15. $\dfrac{x^2-4}{x^2-3x+2}=0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{-2\}$

16. $1-\dfrac{3}{x}-\dfrac{10}{x^2}=0 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{-2,\ 5\}$

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17. $\frac{6}{x^2}-\frac{5}{x}+1=0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {2, 3}

18. $\frac{1}{x-1}-\frac{1}{x}=\frac{1}{2} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {–1,2}

19. $(x+4)\cdot(x+2)\cdot(1-x)=0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {–4,–2,1}

20. $f(x)=x^2-px+12,$
$f(x_1)=f(x_2)=0,\ x_1=4$
$\Rightarrow$ **p = ?**

Yanıt / The Answer is 7

21. $f(x)=ax^2+bx-6,$
$f(x_1)=f(x_2)=0,\ x_1=-2 \Rightarrow$ **2a – b = ?**

Yanıt / The Answer is 3

22. $f(x)=x^2-(k+1)\cdot x+2=0$
$f(x_1)=f(x_2)=0,\ x_1=1$
$\Rightarrow$ **x_2 = ?**

Yanıt / The Answer is 2

23. $x^2-(m+3)x+1=0,$
$f(x_1)=f(x_2)=0,\ x_1=2-\sqrt{3}$
$\Rightarrow$ **m = ?**

Yanıt / The Answer is 1

24. $f(x)=ax^2+bx+c,\ f(x_1)=f(x_2)=0,$
$x_1=1-\sqrt{2} \Rightarrow$ **x_2 = ?**

Yanıt / The Answer is $1+\sqrt{2}$

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25. $x^4 - 13x^2 + 36 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{\pm 2, \pm 3\}$

26. $(3x-1)^2 - 4\cdot(3x-1) + 4 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{1\}$

27. $(x^2+1)^2 - 6(x^2+1) + 5 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{0, \mp 2\}$

28. $\left(x+\frac{1}{x}\right)^2 - 2\left(x+\frac{1}{x}\right) + 1 = 0 \Rightarrow$ $x^2 - x = ?$

Yanıt / The Answer is -1

29. $9^x - 2\cdot 3^{x+1} - 27 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{2\}$

30. $x + \sqrt{x} - 6 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{4\}$

31. $x^{-2} - 4x^{-1} + 4 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\left\{\frac{1}{2}\right\}$

32. $x^{\frac{4}{3}} - 3\cdot x^{\frac{2}{3}} + 2 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{\pm 2\sqrt{2}, \pm 1\}$

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33. $x - 2\sqrt{x} + 1 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {1}

37. $x^2 - 11x + 12 = 0$, ÇK(SS) = $\{x_1, x_2\}$

$\Rightarrow$ $\mathbf{x_1 + x_2 = ?}$

Yanıt / The Answer is 11

34. $\sqrt{x+2} = x + 2 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {–2,–1}

38. $-x^2 - 5x + 10 = 0$, ÇK(SS) = $\{x_1, x_2\}$

$\Rightarrow$ $\mathbf{x_1 \cdot x_2 = ?}$

Yanıt / The Answer is –10

35. $\sqrt{x+3} + 2 = 1 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is Ø

39. $2x^2 - 7x + 3 = 0$, ÇK(SS) = $\{x_1, x_2\}$

$\Rightarrow$ $\mathbf{x_1 \cdot x_2 = ?}$

Yanıt / The Answer is $\frac{3}{2}$

36. $x^2 - 5x + 6 = 0$, ÇK(SS) = $\{x_1, x_2\}$

$\Rightarrow$ $\mathbf{x_1 + x_2 = ?}$

Yanıt / The Answer is 5

40. $3x^2 - x - 1 = 0$, ÇK(SS) = $\{x_1, x_2\}$

$\Rightarrow$ $\mathbf{\frac{1}{x_1} + \frac{1}{x_2} = ?}$

Yanıt / The Answer is –1

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41. $x^2-7x+6=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow\ \mathbf{x_1 \cdot x_2 + x_1 + x_2 = ?}$

Yanıt / The Answer is 13

42. $x^2+ax+6=0,\ ÇK(SS)=\{x_1,x_2\},$

$x_1+x_2=6\ \Rightarrow\ \mathbf{a=?}$

Yanıt / The Answer is –6

43. $2x^2-3x+m=0,\ ÇK(SS)=\{x_1,x_2\},$

$x_1 \cdot x_2=8\ \Rightarrow\ \mathbf{m=?}$

Yanıt / The Answer is 16

44. $2x^2+ax-1=0\ \ ÇK(SS)=\{x_1,x_2\}$

$x_1+x_2+x_1 \cdot x_2=5\ \Rightarrow\ \mathbf{a=?}$

Yanıt / The Answer is –11

45. $x^2-7x+12=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow\ \mathbf{x_1^2 \cdot x_2 + x_1 \cdot x_2^2 = ?}$

Yanıt / The Answer is 84

46. $x^2-5x-4=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow\ \mathbf{x_1^2+x_2^2=?}$

Yanıt / The Answer is 33

47. $2x^2-4x+1=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow\ \mathbf{x_1^3+x_2^3=?}$

Yanıt / The Answer is 5

48. $3x^2+2x-1=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow\ \mathbf{|x_1-x_2|=?}$

Yanıt / The Answer is $\frac{4}{3}$

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49. $x^2-3x-2=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow\ x_1^2\cdot x_2+x_1\cdot x_2^2=?$

Yanıt / The Answer is –6

50. $x^2+6x+2m=0,\ ÇK(SS)=\{x_1,x_2\}$

$(x_1-2)\cdot(x_2-2)=12\ \Rightarrow\ m=?$

Yanıt / The Answer is –2

51. $2x^2+kx-5=0,\ ÇK(SS)=\{x_1,x_2\}$

$(2x_1+1)\cdot(2x_2+1)=-20\ \Rightarrow\ k=?$

Yanıt / The Answer is 11

52. $x^2-(a+1)x+a=0,\ x_1=-x_2$

$\Rightarrow\ x_1\cdot x_2=?$

Yanıt / The Answer is –1

53. $x^2-2x+p=0,\ ÇK(SS)=\{x_1,x_2\}$

$\frac{1}{x_1}+\frac{1}{x_2}=2\ \Rightarrow\ p=?$

Yanıt / The Answer is 1

54. $x^2-6x+4=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow\ \frac{1}{x_1+1}+\frac{1}{x_2+1}=?$

Yanıt / The Answer is $\frac{8}{11}$

55. $x^2-3x-1=0,\ ÇK(SS)=\{x_1,x_2\};$

$f(x)=x^2+bx+c,\ ÇK(SS)=\{x_1-2,x_2-2\}$

$\Rightarrow\ f(x)=?$

Yanıt / The Answer is x^2+x-3

56. $x^2-2x-4=0,\ ÇK(SS)=\{x_1,x_2\};$

$f(x)=x^2+bx+c,\ ÇK(SS)=\{x_1-1,x_2-1\}$

$\Rightarrow\ f(x)=?$

Yanıt / The Answer is x^2-5

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57. $x^2+2x+p-3=0,\ ÇK(SS)=\{x_1,x_2\},$

$4x_1-x_2=7 \Rightarrow \mathbf{x_1 \cdot x_2 = ?}$

Yanıt / The Answer is –3

58. $x^2+(3x_2-5)x+2x_1=0,\ ÇK(SS)=\{x_1,x_2\},$

$x_1,x_2 \neq 0 \Rightarrow \mathbf{x_1^2+x_2^2=?}$

Yanıt / The Answer is 13

59. $9x^2-8x+1=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow \mathbf{\sqrt{x_1}+\sqrt{x_2}=?}$

Yanıt / The Answer is $\frac{\sqrt{14}}{3}$

60. $3x^2+4x+3a-4=0,\ ÇK(SS)=\{x_1,x_2\};$

$3x^2-3x+3a+3=0,\ ÇK(SS)=\{x_1,x_3\}$

$\Rightarrow \mathbf{a=?}$

Yanıt / The Answer is – 1

61. $x^2-(a-1)x-8=0,\ ÇK(SS)=\{x_1,x_2\},$

$x_1=x_2^2 \Rightarrow \mathbf{a=?}$

Yanıt / The Answer is 3

62. $x^2-3mx+6n=0,\ ÇK(SS)=\{m,n\}$

$\Rightarrow \mathbf{m+n=?}$

Yanıt / The Answer is 18

63. $x^2-4x+2k-1=0,\ ÇK(SS)=\{x_1,x_2\},$

$x_1=3\cdot x_2 \Rightarrow \mathbf{k=?}$

Yanıt / The Answer is 2

64. $2x^2-kx+4=0,\ ÇK(SS)=\{x_1,x_2\},$

$x_1^2=4\cdot x_2 \Rightarrow \mathbf{k=?}$

Yanıt / The Answer is 6

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65. $x^2-4x+1=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow \dfrac{1}{\sqrt{x_1}}+\dfrac{1}{\sqrt{x_2}}=?$

Yanıt / The Answer is $\sqrt{6}$

---

66. $x^2-6x+c=0,\quad ÇK(SS)=\{x_1,x_2\};$

$x^2+ax-b+1=0,\quad ÇK(SS)=\{x_1+2,x_2+2\}$

$\Rightarrow$ **a = ?**

Yanıt / The Answer is –10

---

67. $x^2-5x+1=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow \dfrac{1}{4-x_1}+\dfrac{1}{4-x_2}=?$

Yanıt / The Answer is –1

---

68. $x^2-5x+6=0,\ ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow \left(\dfrac{1}{x_1}+x_2\right)\cdot\left(\dfrac{1}{x_2}+x_1\right)=?$

Yanıt / The Answer is $\dfrac{49}{6}$

---

69. $x^2+(m+5)x+m+1=0,\ x_1=-x_2$

$\Rightarrow$ **m = ?**

Yanıt / The Answer is –5

---

70. $(a-3)x^2-2ax+a+12=0,\ ÇK(SS)=\{x_1,x_2\},$

$x_1=x_2\ \Rightarrow$ **a = ?**

Yanıt / The Answer is 4

---

71. $2x^2-x+a+1=0,\ ÇK(SS)=\{x_1,x_2\},$

$x_1-x_2=0\ \Rightarrow$ **a = ?**

Yanıt / The Answer is $-\dfrac{7}{8}$

---

72. $(x-2)\cdot(x^2-3x+2)=0$

$\Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{1,2\}$

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73. $\frac{x^2-3x+2}{(x-2)^2}=0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{1\}$

74. $\frac{x^2-3x-4}{x^2+1}=0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{-1,4\}$

75. $x^3-7x^2-8x=0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{-1,0,8\}$

76. $x^3+3x^2-4x-12=0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{-3,-2,2\}$

77. $x^3-7x^2+14x-8$, ÇK(SS) $=\{4,x_2,x_3\}$

$\Rightarrow x_2+x_3=?$

Yanıt / The Answer is 3

78. $x^3-6x^2+11x-6=0$, ÇK(SS) $=\{3,x_2,x_3\}$

$\Rightarrow x_2\cdot x_3=?$

Yanıt / The Answer is 2

79. $x^3+mx^2+3x+5=0$,

ÇK(SS) $=\{x_1,x_2,x_3\}$,

$x_1+x_2+x_3=2 \Rightarrow m=?$

Yanıt / The Answer is – 2

80. $x^3-3x^2-2x+6=0$, ÇK(SS) $=\{x_1,x_2,x_3\}$

$\Rightarrow x_1+x_2+x_3=?$

Yanıt / The Answer is 3

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1. $x^2+7x+12=0 \Rightarrow$ **ÇK(SS) = ?**

A) {–4} B) {–3} C) {–4, –3} D) {3, 4} E) {4}

2. $f(x)=2\cdot(x+2)\cdot(x+3)$,

$f(x_1)=f(x_2)=0 \Rightarrow \dfrac{x_1+x_2}{x_1\cdot x_2}=?$

A) $\frac{1}{6}$ B) $-\frac{1}{6}$ C) $\frac{5}{6}$ D) $-\frac{5}{6}$ E) 2

3. $x^2-6x+13=0 \Rightarrow$ **ÇK(SS) = ?**

A) {4, 9} B) {–10, –3} C) {2, 5} D) {–1, 6} E) ∅

4. $\dfrac{5}{x-1}+\dfrac{x}{x+1}=\dfrac{10}{x^2-1} \Rightarrow$ **x = ?**

A) –5 B) –4 C) –3 D) –2 E) –1

5. $x^2-4x+1=0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{2-\sqrt{3}, 2+\sqrt{3}\}$ B) $\{2-\sqrt{2}, 2+\sqrt{2}\}$ C) $\{3-\sqrt{2}, 3+\sqrt{2}\}$ D) $\{2-2\sqrt{2}, 2+2\sqrt{2}\}$ E) $\{3-2\sqrt{2}, 3+2\sqrt{2}\}$

6. $\dfrac{x}{x+2}+\dfrac{x}{x+3}=1 \Rightarrow$ **ÇK(SS) = ?**

A) $\{-\sqrt{3}, \sqrt{3}\}$ B) $\{-\sqrt{6}, \sqrt{6}\}$ C) {–1, 1} D) {–3, 3} E) {–6, 6}

7. $\dfrac{1}{3x^2}+\dfrac{3}{4x}-\dfrac{15}{6}=0 \Rightarrow \sum x=?$

A) $\frac{5}{8}$ B) $\frac{3}{10}$ C) $-\frac{3}{10}$ D) $-\frac{5}{8}$ E) $-\frac{1}{2}$

8. $x^2-2x-4=0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{-\sqrt{5}, \sqrt{5}\}$ B) $\{2-\sqrt{5}, 2+\sqrt{5}\}$ C) $\{-2\sqrt{5}, 2\sqrt{5}\}$ D) $\{1-\sqrt{5}, 1+\sqrt{5}\}$ E) {–2, 2}

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9. $m \in Z^+$, ÇK(SS) = ∅,
$x^2 - 5mx + 25 = 0 \Rightarrow \sum m = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

10. $x^2 - mx - x + m = 0$,
$f(x_1) = f(x_2) = 0,\ x_1 = x_2 \Rightarrow$ **m = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

11. $a \neq 1$, $ax^2 - (a + 1)x + a = 0$,
ÇK(SS) = $\{x_1, x_2\}$, $x_1 = x_2 \Rightarrow$ **a = ?**

A) 2 B) $\frac{2}{3}$ C) $\frac{1}{3}$ D) $-\frac{1}{3}$ E) –1

12. $x^2 - 2x + m + 1 = 0$, ÇK(SS) = $\{x_1, x_2\}$,
$x_1 \neq x_2 \Rightarrow$ **? < m < ?**

A) m > 0 B) m < 0 C) m < –1
D) m > –1 E) m > 1

13. $x^4 - 13x^2 + 36 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {–2, 2} B) {–3, 3} C) {–3, –2}
D) {–3, –2, 2, 3} E) {2, 3}

14. $x^4 - 26x^2 + 25 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {–1, 11} B) {–5, 5} C) {–5, –1}
D) {–5, –1, 1, 5} E) {1, 5}

15. $3x^2 - (2k - 1)x - 5k + 1 = 0$,
ÇK(SS) = $\{x_1, x_2\}$, $x_1 = -2$
$\Rightarrow$ $\mathbf{x_2 = ?}$

A) 9 B) 8 C) 7 D) 6 E) 5

16. $x^2 - (2m - 4)x - 15 = 0$,
ÇK(SS) = $\{x_1, x_2\}$, $x_1 = -3$
$\Rightarrow$ $\mathbf{m - x_2 = ?}$

A) –2 B) 0 C) 3 D) 6 E) 8

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1	2	3	4	5	6	7	8
C	D	E	A	A	B	B	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	D	D	B	D	D	A	A

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1. $2x^2 - ax + 2x + 1 = 0$,

$x = a \Rightarrow$ **a = ?**

A) –3 B) –2 C) –1 D) 1 E) 2

2. $mx^2 + 3mx - 2x + 6 = 0$,

$ÇK(SS) = \{x_1, x_2\}$, $x_1 = -1 \Rightarrow$ $\mathbf{x_2 = ?}$

A) $-\frac{5}{2}$ B) $-\frac{3}{2}$ C) $-\frac{1}{2}$ D) $\frac{1}{2}$ E) $\frac{3}{2}$

3. $x^2 + mx + nx + n = 0$,

$ÇK(SS) = \{-1, 1\} \Rightarrow$ **n = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

4. $x^2 + (a - 2)x - a^2 + 2a - 3 = 0$, $ÇK(SS) = \{x_1, x_2\}$,

$x_1 = 2 \Rightarrow \sum$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $mx^3 + (m - 3)x^2 - mx + 2 = 0$,

$ÇK(SS) = \{x_1, x_2, x_3\}$,

$x_1 = -1 \Rightarrow$ **m = ?**

A) 0 B) 1 C) 2 D) –3 E) 4

6. $18 \cdot 2^x + 5 \cdot 2^{x-1} - 164 = 0$

$\Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

7. $3 \cdot 9^x - 8 \cdot 3^x - 3 = 0 \Rightarrow$ **x = ?**

A) $\frac{1}{3}$ B) 0 C) 1 D) $\frac{2}{3}$ E) 5

8. $4^x - 9 \cdot 2^x + 8 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {0, 3} B) {–3, 0} C) {–3} D) {0} E) {3}

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9. $x - 7\sqrt{x} + 10 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {4} B) {25} C) {4, 25} D) {2} E) {2, 5}

10. $(x-2)^2 + 2.(x-2).(x+3) + (x+3)^2 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{-3\}$ B) $\left\{-\frac{3}{2}\right\}$ C) $\left\{-\frac{3}{2}, -\frac{1}{2}\right\}$ D) $\left\{-\frac{1}{2}\right\}$ E) $\left\{-\frac{1}{2}, 3\right\}$

11. $(x^2-1)^2 + 2(x^2-1) - 3 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {–1, 1} B) $\{-\sqrt{2}, \sqrt{2}\}$ C) $\{-\sqrt{3}, \sqrt{3}\}$ D) {–2, 2} E) $\{-\sqrt{5}, \sqrt{5}\}$

12. $(2x+3)^2 - 9(x-1)^2 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {0} B) {0, 3} C) {3, 6} D) {3, 9} E) {0, 6}

13. $x \in R$,

$(x^2-x)^2 - 2(x^2-x) - 8 = 0 \Rightarrow \sum x = ?$

A) –1 B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) 1

14. $x \in R$,

$3^x - 10\sqrt{3^x} + 9 = 0 \Rightarrow \sum x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

15. $\left(\frac{2x+1}{x}\right)^2 + 2\left(\frac{2x+1}{x}\right) - 3 = 0$

$\Rightarrow$ **ÇK(SS) = ?**

A) R B) $\left\{-\frac{1}{5}\right\}$ C) $\{-1\}$ D) $\left\{-1, -\frac{1}{5}\right\}$ E) $\{0\}$

16. $(x+3)^4 + 2(x+3)^2 - 3 = 0$

$\Rightarrow$ **ÇK(SS) = ?**

A) $\{-4\}$ B) $\{-2\}$ C) $\varnothing$ D) $\{-3\}$ E) $\{-4, -2\}$

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1	2	3	4	5	6	7	8
C	B	B	D	B	C	C	A
9	10	11	12	13	14	15	16
C	D	B	E	E	D	D	E

1. $4x^2 + 3x + m = 0$

$\triangle = 25 \Rightarrow$ **m = ?**

A) –7 B) –5 C) –3 D) –1 E) 0

2. $x^2 - nx + 16m^2 = 0$,

$\triangle = 32$,

$n = 8(m + 1) \Rightarrow$ **8m + n = ?**

A) 2 B) 4 C) 6 D) 8 E) 16

3. $\frac{x^2+4x-5}{x^2+2x-3} = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{-10\}$ B) $\{-5\}$ C) $\{0\}$ D) $\{-3\}$ E) $\{-5,1\}$

4. $(x-1)^2 - 3x + 5 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{0,1\}$ B) $\{1\}$ C) $\{2\}$ D) $\{2,3\}$ E) $\{1,2,3\}$

5. $x^2 - 1 = 4(x+1) \Rightarrow$ **ÇK(SS) = ?**

A) $\{-1\}$ B) $\{5\}$ C) $\{-1,5\}$ D) $\mathbb{R}$ E) $\varnothing$

6. $2^{x^2-7x+6} = 1$

$\Rightarrow$ **ÇK(SS) = ?**

A) $\{0,1\}$ B) $\{-1,0,1\}$ C) $\{1,6\}$ D) $\{6\}$ E) $\{-1,1,6\}$

7. $x^2 + 6x + 3 - a = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 = x_2 \Rightarrow$ **a = ?**

A) –18 B) –12 C) –6 D) 0 E) 6

8. $x^2 + mx + n = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 = -3$, $x_2 = 5$,

$(2x+1)^2 + m(2x+1) + n = 0$

$\Rightarrow$ **ÇK(SS) = ?**

A) $\{-2\}$ B) $\{2\}$ C) $\varnothing$ D) $\{-2,2\}$ E) $\{0,2\}$

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9. $(x + 3)^2 = 8x + a$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 = x_2 \Rightarrow$ **a = ?**

A) 13 B) 11 C) 9 D) 8 E) 7

10. $mx^2 - (2m - 1)x + m + 1 = 0$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 = x_2 \Rightarrow$ **m = ?**

A) $\frac{1}{4}$ B) $\frac{1}{8}$ C) $\frac{1}{3}$ D) $\frac{1}{9}$ E) $\frac{1}{24}$

11. $x^2 + (a - b)x + b - a = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 = x_2$, $a + b = 12$, $a \neq b \Rightarrow$ **b = ?**

A) 2^5 B) 2^4 C) 2^3 D) 2^2 E) -2^2

12. $ax^2 - 12x + a = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1, x_2 \in R$, $x_1 \neq x_2$

$\Rightarrow a \in Z$, $\sum a = ?$

A) −12 B) 0 C) 12 D) 24 E) 48

13. $x^2 - (2n - 3m)x - 4m = 0$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 = n$, $x_2 = m \Rightarrow \triangle = ?$

A) 121 B) 100 C) 81 D) 16 E) 9

14. $x^2 - mx + n = 0$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 = x_2 = 4 \Rightarrow \frac{n}{m} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

15. $x^2 + (n - 2m)x + 6n = 0$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 = m$, $x_2 = n \Rightarrow$ **n·m = ?**

A) 90 B) 72 C) 54 D) 36 E) 18

16. $x^2 + (4 - a)x + a - b + 6 = 0$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 = a$, $x_2 = b \Rightarrow$ **a + b = ?**

A) −6 B) −4 C) −2 D) 0 E) 2

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1	2	3	4	5	6	7	8
D	B	B	D	C	C	C	D
9	10	11	12	13	14	15	16
D	B	C	B	E	A	E	A

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1. $x \in R$,

$x^2 - 4x + 8 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) R B) ∅ C) {0} D) {0,1} E) {−1}

2. $x^2 + bx + 4 = 0$, ÇK(SS) = ∅,

$b \in Z \Rightarrow$ **min(b) = ?**

A) –3 B) –4 C) –5 D) –6 E) –7

3. $x^3 - 3x^2 + 2x = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {0} B) {1} C) {0,2} D) {1,2} E) {0,1,2}

4. $(x + 2)^2 + 3(x + 2) + 2 = 0$

$\Rightarrow$ **ÇK(SS) = ?**

A) {−3} B) {−4} C) {−4,−3} D) {3} E) {−4,−3,3}

5. $x \in R$, $\sqrt{x+2} - x = 5 \Rightarrow$ **ÇK(SS) = ?**

A) R B) –2 C) –5 D) –7 E) ∅

6. $\sqrt{2x-1} = x - 2 \Rightarrow$ **ÇK(SS) = ?**

A) {1,5} B) {−1,1} C) {1} D) {5} E) {3,5}

7. $x^3 - \frac{2}{x-5} = 64 + \frac{2}{5-x} \Rightarrow$ **x = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

8. $9^x - 28 \cdot 3^x + 27 = 0$

$\Rightarrow$ **ÇK(SS) = ?**

A) {0} B) {1} C) {2} D) {0,3} E) {0,1,2,3}

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9. $2x^2 - 8x + 5 = 0$, $ÇK(SS) = \{x_1, x_2\}$

$\Rightarrow$ $\mathbf{x_1 + x_2 = ?}$

A) – 1 B) $\frac{5}{2}$ C) 3 D) $\frac{3}{2}$ E) 4

10. $x^2 + 4x + 2 = 0$, $ÇK(SS) = \{x_1 , x_2\}$

$\Rightarrow \dfrac{\mathbf{x_1 + x_2}}{\mathbf{x_1 \cdot x_2}} = \mathbf{?}$

A) 2 B) –2 C) 1 D) –1 E) –4

11. $x^2 + 6x - 4 = 0$, $ÇK(SS) = \{x_1 , x_2\}$

$\Rightarrow$ $\mathbf{x_1^2 \cdot x_2 + x_2^2 \cdot x_1 = ?}$

A) 2 B) –2 C) –10 D) –24 E) 24

12. $x^2 - 8x + 3b - 6 = 0$, $ÇK(SS) = \{x_1 , x_2\}$,

$\frac{x_1}{5} = \frac{x_2}{3} \Rightarrow \mathbf{b = ?}$

A) 7 B) 5 C) 9 D) 3 E) 13

13. $x^2 + (m - 3)x - 6 = 0$, $ÇK(SS) = \{x_1 , x_2\}$,

$x_2 \cdot (1 - x_1) = 4 \Rightarrow \mathbf{m = ?}$

A) 2 B) 6 C) 10 D) 14 E) 16

14. $x^2 - 5x + m = 0$, $ÇK(SS) = \{x_1 , x_2\}$,

$x_2 = x_1 + 1 \Rightarrow \mathbf{m = ?}$

A) –5 B) –6 C) 6 D) 5 E) 11

15. $x^2 + 4x + 2a - 8 = 0$, $ÇK(SS) = \{x_1 , x_2\}$,

$x_1 - x_2 = 8 \Rightarrow \mathbf{a = ?}$

A) –8 B) –6 C) –4 D) –2 E) 0

16. $x^2 - 10x + 4 = 0$, $ÇK(SS) = \{x_1, x_2\}$

$\Rightarrow \sqrt{\mathbf{x_1}} - \sqrt{\mathbf{x_2}} \in \mathbf{R^+ = ?}$

A) $\sqrt{3}$ B) 2 C) $\sqrt{5}$ D) $\sqrt{7}$ E) $\sqrt{6}$

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1	2	3	4	5	6	7	8
B	A	E	C	E	D	B	D
9	10	11	12	13	14	15	16
E	B	E	A	A	C	D	E

1. $x^2 - 3x - 5 = 0$, ÇK(SS) = $\{x_1, x_2\}$ $\Rightarrow$ $\mathbf{x_1 + x_2 = ?}$

A) –3 B) $-\frac{3}{2}$ C) $\frac{3}{2}$ D) 3 E) –5

2. $x^2 - 6x + m = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 \cdot x_2 + x_1 + x_2 = 13$ $\Rightarrow$ $\mathbf{m = ?}$

A) 4 B) 5 C) 6 D) 7 E) 8

3. $3x^2 - (m - 2)x + 2 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 + x_2 = -2$ $\Rightarrow$ $\mathbf{m = ?}$

A) –8 B) –6 C) –4 D) –2 E) –1

4. $x^2 + 12x - 5 = 0$, ÇK(SS) = $\{x_1, x_2\}$ $\Rightarrow$ $\mathbf{x_1 \cdot x_2 = ?}$

A) –5 B) –2 C) 5 D) 6 E) 12

5. $x^2 - (a-2)x + 5 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 + \frac{1}{x_2} = 6$ $\Rightarrow$ $\mathbf{a = ?}$

A) 5 B) 6 C) 7 D) 8 E) 9

6. $2x^2 + 5x - 7 = 0$,

$f(x_1) = f(x_2) = 0$ $\Rightarrow$ $\mathbf{\frac{1}{x_1} + \frac{1}{x_2} = ?}$

A) $\frac{5}{2}$ B) $\frac{7}{2}$ C) $\frac{7}{5}$ D) $\frac{5}{7}$ E) $\frac{2}{7}$

7. $2x^2 - 4x - 5 = 0$, ÇK(SS) = $\{x_1, x_2\}$

$\Rightarrow$ $\mathbf{\frac{1}{x_1} + \frac{1}{x_2} = ?}$

A) – 2 B) $-\frac{4}{5}$ C) $\frac{4}{5}$ D) 2 E) 4

8. $mx^2 + (1 - m)x + 3 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 + x_2 = 17$ $\Rightarrow$ $\mathbf{x_1 \cdot x_2 = ?}$

A) 48 B) 1 C) 17 D) –17 E) –48

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9. $mx^2 - 5x - 3m + 2 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 \cdot x_2 = -\frac{1}{3} \Rightarrow$ **m = ?**

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{4}{5}$ E) $\frac{5}{6}$

10. $x^2 - 2x - 3 = 0$, $f(x_1) = f(x_2) = 0$

$\Rightarrow \left(x_1 + \frac{1}{x_2}\right) \cdot \left(x_2 + \frac{1}{x_1}\right) = ?$

A) $-\frac{15}{4}$ B) $-\frac{16}{3}$ C) $\frac{3}{2}$ D) $-\frac{4}{3}$ E) $\frac{1}{2}$

11. $x^2 - 2x - 5 = 0$, ÇK(SS) = $\{x_1, x_2\}$

$\Rightarrow \left(x_1 + \frac{1}{x_2}\right) \cdot \left(x_2 - \frac{1}{x_1}\right) = ?$

A) $-\frac{24}{5}$ B) $-\frac{16}{5}$ C) $-\frac{12}{5}$ D) $-\frac{8}{5}$ E) $-\frac{4}{5}$

12. $f(x) = x^2 - (m+4)x + 5m - 2$, $f(x_1) = f(x_2) = 0$,

$\frac{6x_1}{x_2} = x_1 - 6 \Rightarrow$ **m = ?**

A) –28 B) –26 C) –24 D) –22 E) –20

13. $2x^2 - 4x + n = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$3x_1 + x_2 = 8 \Rightarrow$ **n = ?**

A) –6 B) –3 C) 1 D) 3 E) 6

14. $m \neq 0$,

$mx^2 - (m-1)x + 1 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 + x_2 = 5 \cdot x_1 \cdot x_2 \Rightarrow$ **m = ?**

A) 8 B) 6 C) 4 D) 2 E) 1

15. $f(x) = x^2 + x + m$

$f(x_1) = f(x_2) = 0$, $x_1 = 2 \cdot x_2 \Rightarrow$ **m = ?**

A) $\frac{2}{3}$ B) $\frac{7}{5}$ C) $\frac{7}{11}$ D) $\frac{3}{4}$ E) $\frac{2}{9}$

16. $x^2 - 4x + 1 = 0$, ÇK(SS) = $\{x_1, x_2\}$

$\Rightarrow x_1^3 + x_2^3 = ?$

A) 52 B) 42 C) 32 D) 22 E) 12

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1	2	3	4	5	6	7	8
D	D	C	A	D	D	B	E
9	10	11	12	13	14	15	16
C	D	A	B	A	B	E	A

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1. $x^2-4x+2=0$, $ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow$ $\mathbf{x_1^2 \cdot x_2 + x_1 \cdot x_2^2 = ?}$

A) 2 B) 3 C) 4 D) 6 E) 8

2. $3x^2-(2m-3)x-12=0$, $f(x_1)=f(x_2)=0$,

$x_1+\frac{1}{x_2}=\frac{3}{4}$ $\Rightarrow$ **m = ?**

A) –4 B) –3 C) 8 D) 10 E) 12

3. $(m-1)x^2+2x+m+3=0, f(x_1)=f(x_2)=0$,

$x_1 \cdot x_2=\frac{2}{m-1}$ $\Rightarrow$ **m = ?**

A) –3 B) –1 C) 1 D) 3 E) 5

4. $m \in Z^+$,

$x^2-8x+m^2-1=0$, $ÇK(SS)=\{x_1x_2\}$,

$x_2=x_1+2$ $\Rightarrow$ **m = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

5. $x^2-5x+m=0$, $ÇK(SS)=\{x_1, x_2\}$,

$x_1=4 \cdot x_2$ $\Rightarrow$ **m = ?**

A) –4 B) –1 C) 0 D) 1 E) 4

6. $x^2+mx-27=0$, $ÇK(SS)=\{x_1,x_2\}$,

$x_1={x_2}^2$ $\Rightarrow$ **m = ?**

A) 6 B) 3 C) 2 D) –2 E) –6

7. $x^2-5x-4k-6=0$, $ÇK(SS)=\{x_1, x_2\}$,

$x_1-3 \cdot x_2=13$ $\Rightarrow$ **k = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

8. $x^2-13x+3m+12=0$, $ÇK(SS)=\{x_1,x_2\}$,

$x_2=2 \cdot x_1+1$ $\Rightarrow$ **m = ?**

A) 5 B) 6 C) 8 D) 9 E) 10

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9. $m \in Z^+$, $x^2-(m-1)x+2=0$,

$ÇK(SS)=\{x_1,x_2\}$, $x_1^2+x_2^2=5 \Rightarrow$ **m = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

10. $x^2+(2m-1)x+m-3=0$, $ÇK(SS)=\{x_1,x_2\}$,

$x_1^2+x_2^2=7 \Rightarrow \sum m = ?$

A) 0 B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

11. $x^2-4x+1=0$, $ÇK(SS)=\{x_1,x_2\} \Rightarrow \sqrt{x_1}+\sqrt{x_2}=?$

A) $\sqrt{2}$ B) 2 C) $\sqrt{6}$ D) $2\sqrt{2}$ E) $2\sqrt{3}$

12. $x^2-8x+4=0$,

$ÇK(SS)=\{x_1,x_2\} \Rightarrow \frac{1}{\sqrt{x_1}}+\frac{1}{\sqrt{x_2}}=?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) 2 D) $\sqrt{5}$ E) 3

13. $x^2-8x-2=0$, $ÇK(SS)=\{x_1,x_2\}$

$\Rightarrow |x_1-x_2|=?$

A) $3\sqrt{2}$ B) $4\sqrt{2}$ C) $5\sqrt{2}$ D) $6\sqrt{2}$ E) $8\sqrt{2}$

14. $x^2-3x+m=0$, $ÇK(SS)=\{x_1,x_2\}$,

$|x_1^2-x_2^2|=6 \Rightarrow$ **m = ?**

A) $\frac{1}{4}$ B) $\frac{3}{4}$ C) 1 D) $\frac{5}{4}$ E) $\frac{7}{4}$

15. $x^2+kx-2=0$, $ÇK(SS)=\{x_1,x_2\}$,

$\frac{2}{3 \cdot x_2}+\frac{2}{3 \cdot x_1}=5 \Rightarrow$ **k = ?**

A) 15 B) 12 C) 10 D) 9 E) 8

16. $x^2-mx-m+2=0$, $ÇK(SS)=\{x_1,x_2\}$,

$\frac{1}{x_1+1}+\frac{1}{x_2+1}=\frac{1}{4} \Rightarrow$ **m = ?**

A) -3 B) $-\frac{5}{4}$ C) 2 D) $\frac{5}{2}$ E) 3

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1	2	3	4	5	6	7	8
E	B	B	C	E	E	E	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	D	C	B	D	D	A	B

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1. $2x^2 + mx - 5 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 + x_2 = m + 6 \Rightarrow$ **m = ?**

A) –3 B) –4 C) 3 D) 4 E) 5

2. $x^2 + 4x + m + 1 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 \cdot x_2 = m^2 + 2m - 5 \Rightarrow \sum$ **m = ?**

A) 5 B) 4 C) 3 D) –1 E) 0

3. $x^2 - (m - 3n + 20)x + m + n = 0$

$f(m) = f(n) = 0 \Rightarrow$ **m – n = ?**

A) $-\frac{15}{4}$ B) $-\frac{15}{2}$ C) –25 D) $\frac{15}{2}$ E) $\frac{15}{4}$

4. $x^2 - 8x + m - 5 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 - x_2 = 4 \Rightarrow$ **m = ?**

A) 12 B) 13 C) 15 D) 16 E) 17

5. $mx^2 - 6mx + 2m + 1 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 = 2 \Rightarrow$ $\mathbf{x_1^2 + x_2^2 = ?}$

A) 24 B) 20 C) 18 D) 12 E) 10

6. $x^2 + mx - 3 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1^3 + x_2^3 = 0 \Rightarrow$ **m = ?**

A) 0 B) –3 C) 1 D) –2 E) 3

7. $x^2 - 2x - 2\sqrt{3} = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$\Rightarrow \mathbf{x_1^3 \cdot x_2^2 + x_1^2 \cdot x_2^3 = ?}$

A) 12 B) 24 C) 16 D) 18 E) 20

8. $x^2 - (m - 2)x + 2 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1^3 \cdot x_2 + x_1 \cdot x_2^3 = 10 \Rightarrow \sum$ **m = ?**

A) 13 B) 10 C) 7 D) 6 E) 4

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9. $x^2 + bx + c = 0$,

ÇK(SS) = $\{\sqrt{2} - \sqrt{3},\ \sqrt{2} + \sqrt{3}\}$

$\Rightarrow$ **b = ?**

A) $-2\sqrt{2}$ B) $2\sqrt{5} - 1$ C) 2 D) 1 E) 0

10. $x^2 - mx + 3 = 0$, ÇK(SS) = $\{1, x_1\}$;

$x^2 - (m + 1)x + k = 0$, ÇK(SS) = $\{2, x_2\}$

$\Rightarrow$ **k = ?**

A) 3 B) 4 C) 5 D) 6 E) 8

11. $x^2 - 2x + a = 0$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 = x_2 + 4 \Rightarrow$ **a = ?**

A) –5 B) –3 C) 0 D) 2 E) 5

12. $mx^2 - 2(m - 1)x - 2 = 0$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 = -x_2 \Rightarrow$ **m = ?**

A) $m < 0$ B) $m > 0$ C) $m = 1$ D) $m > 1$ E) $m < 1$

13. $-x^2 + (m - 2)x - 8 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1^2 = x_2 \Rightarrow$ **m = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

14. $x^2 + (m - 3)x + 1 = 0$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 < 0,\ x_2 < 0$

$\Rightarrow$ **? < m < ?**

A) $2 < m < 5$ B) $m > 5$ C) $m > 3$ D) $m < 1$ E) $1 < m < 5$

15. $x^2 - |x| - 12 = 0 \Rightarrow \prod x = ?$

A) –9 B) –12 C) –16 D) –20 E) –24

16. $f(x) = x^2 - |2x - 4| - 7 = 0$

$f(x_1) = f(x_2) = 0 \Rightarrow x_1 + x_2 = ?$

A) $2 - 2\sqrt{3}$ B) $2+\sqrt{3}$ C) $1-\sqrt{3}$ D) $1+\sqrt{3}$ E) 2

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	D	A	E	B	A	B	E
9	10	11	12	13	14	15	16
A	D	B	C	D	C	C	A

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1. $\frac{x^2-2x-3}{x^2-x-6}=0 \Rightarrow$ **ÇK(SS) = ?**

A) {–3} B) {–1} C) {1} D) {3} E) {–1, 3}

2. $(2x-1)\cdot(x+1)+(2x-1)\cdot(x-3)=0 \Rightarrow \sum x = ?$

A) $\frac{3}{2}$ B) 2 C) $\frac{5}{2}$ D) 3 E) $\frac{7}{2}$

3. $(3x-2)^2-5(3x-2)-6=0$, ÇK(SS) = $\{x_1, x_2\}$

$\Rightarrow$ $x_1 + x_2 = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

4. $x^2+mx+1=0$, ÇK(SS) = $\{x_1, x_2\}$;

$x^2+x+m=0$, ÇK(SS) = $\{x_1, x_3\}$ $\Rightarrow$ **m = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

5. $x^2-bx+c=0$, ÇK(SS) = $\{4, x_1\}$;

$x^2-mx+n=0$, ÇK(SS) = $\{5, -x_1\}$ $\Rightarrow$ **b + m = ?**

A) 2 B) 3 C) 5 D) 6 E) 9

6. $x^2-mx-2x-m=0$, ÇK(SS) = $\{x_1, x_2\}$,

$\frac{1}{x_1}+\frac{1}{x_2}=m+2 \Rightarrow \sum m = ?$

A) –1 B) –2 C) –3 D) –4 E) –5

7. $3x^2-(2m-1)x+5m-3=0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 = x_2 \Rightarrow \sum m = ?$

A) 15 B) 16 C) 18 D) 20 E) 22

8. $m \neq 0$ ve (and) $n \neq 0$,

$x^2-(3m-2n)x+m=0$, ÇK(SS) = $\{m, n\}$

$\Rightarrow$ **m + n = ?**

A) 3 B) $\frac{5}{2}$ C) 2 D) $\frac{3}{2}$ E) 1

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9. $x \in R$,

$x^2 - \sqrt{x^2 - 4x + 4} = -2 \Rightarrow$ **ÇK(SS) = ?**

A) $\{-2\}$ B) $\{-2, 0\}$ C) $\{-1, 0\}$ D) $\{-2, -1\}$ E) $\{-1\}$

10. $m \in R^+$, $x^2 - (m-4)x + 25 = 0$

ÇK(SS) = $\{x_1, x_2\}$, $x_1 = x_2 \Rightarrow$ **m = ?**

A) 10 B) 12 C) 14 D) 16 E) 18

11. $x^2 - (m-4)x + 16 = 0$,

ÇK(SS) = $\{x_1, x_2\}$, $\sqrt{x_1} + \sqrt{x_2} = 3 \Rightarrow$ **m = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $2x^2 - 3x + m + 1 = 0$, $f(x_1) = f(x_2) = 0$,

$x_1 + x_2 + x_1 \cdot x_2 = -8 \Rightarrow$ **m = ?**

A) –20 B) –16 C) –14 D) –12 E) –10

13. $x^2 + (2-m) \cdot x + 3n = 0$,

ÇK(SS) = $\{m, n\} \Rightarrow$ **m – n = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

14. $(m+1)x^2 - 2mx + m - 2 = 0$,

ÇK(SS) = $\{x_1, x_2\}$, $x_1 - x_2 = 2 \Rightarrow \sum$ **m = ?**

A) $-\frac{1}{4}$ B) $-\frac{1}{3}$ C) -1 D) $\frac{1}{2}$ E) $\frac{1}{4}$

15. $\left(x + \frac{1}{x}\right)^2 - 6x - \frac{6}{x} + 9 = 0$

ÇK(SS) = $\{x_1, x_2\} \Rightarrow$ **$x_1 + x_2$ = ?**

A) –3 B) –2 C) 2 D) 3 E) 6

16. $4^x - 10 \cdot 2^x + 16 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {1} B) {2} C) {3} D) {1, 3} E) {2, 3}

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	A	C	A	E	C	B	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	C	E	A	B	C	D	A

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1. $x^2 - 3x + m + 1 = 0$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 \cdot x_2 = 2m - 5 \Rightarrow$ **m = ?**

A) 0 B) 3 C) 6 D) 9 E) 12

2. $2x^2 - x + p^2 + 3p = 0$, ÇK(SS) = $\{x_1 , x_2\}$,

$x_1 \cdot x_2 = 5,\ p \in R^+ \Rightarrow$ **p = ?**

A) 1 B) 2 C) 5 D) 6 E) 10

3. $x^2 - (m - 2)x - 5 = 0$,

$f(x_1) = f(x_2) = 0,\ x_1 + \frac{1}{x_2} = 2 \Rightarrow$ **m = ?**

A) $\frac{1}{2}$ B) $\frac{5}{2}$ C) $\frac{9}{2}$ D) $\frac{13}{2}$ E) $\frac{17}{2}$

4. $x^2 - 8x + c + 6 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1^2 - x_2^2 = 16 \Rightarrow$ **c = ?**

A) 9 B) 16 C) 25 D) 36 E) 49

5. $x^2 - 10x + m^2 + 5 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$x_1 - x_2 = 4,\ m > 0 \Rightarrow$ **m = ?**

A) 16 B) 12 C) 8 D) 4 E) 2

6. $(m - 1)x^2 - (2m + 1)x + m + 11 = 0$,

$f(x_1) = f(x_2) = 0,\ x_1 + x_2 = 3 \Rightarrow$ **$x_1 \cdot x_2$ = ?**

A) 5 B) 11 C) 17 D) 22 E) 27

7. $m \in R^+$,

$(m - 4)x^2 + 4x + m + 7 = 0$,

$f(x_1) = f(x_2) = 0,\ x_1 \cdot x_2 = 2m + 2 \Rightarrow$ **m = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

8. $x^2 - 3x + 2m = 0$

ÇK(SS) = $\{x_1, x_2\}$,

$x_1^3 + x_2^3 = 9 \Rightarrow$ **m = ?**

A) 81 B) 27 C) 18 D) 9 E) 1

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9. $x^2 - mx + 9 = 0$, $ÇK(SS) = \{x_1, x_2\}$,

$\sqrt{x_1} + \sqrt{x_2} = 3 \Rightarrow$ **m = ?**

A) –3 B) 3 C) 0 D) 9 E) –9

10. $3x^2 + 4x - 1 = 0$, $ÇK(SS) = \{x_1, x_2\}$

$\Rightarrow \sqrt{x_1^2 + x_2^2 - x_1 \cdot x_2} = ?$

A) $\frac{3}{5}$ B) $\frac{4}{3}$ C) $\frac{5}{3}$ D) $\frac{3}{4}$ E) $\frac{1}{4}$

11. $x^2 + 6x - 1 = 0$, $ÇK(SS) = \{x_1, x_2\}$;

$ax^2 + bx + c = 0$, $ÇK(SS) = \left\{\frac{1}{x_1}, \frac{1}{x_2}\right\}$

$\Rightarrow$ **a + b + c = ?**

A) –14 B) 14 C) 0 D) 6 E) – 6

12. $x^2 - 7x + 12 = 0$, $ÇK(SS) = \{x_1, x_2\}$;

$ax^2 + bx + c = 0$, $ÇK(SS) = \left\{\frac{1}{x_1}, \frac{1}{x_2}\right\}$

$\Rightarrow$ **a + b + c = ?**

A) 6 B) 3 C) 0 D) –3 E) – 18

13. $2x^2 - 3x + 5 = 0$, $ÇK(SS) = \{x_1, x_2\}$;

$ax^2 + bx + c = 0$, $ÇK(SS) = \{x_1 - 3, x_2 - 3\}$

$\Rightarrow$ **a + b – c = ?**

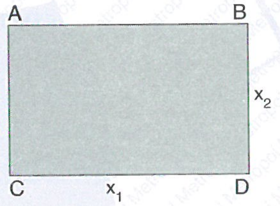
A) –3 B) –2 C) –1 D) 0 E) 3

14. $x \in R$,

$x^2 - |3x - 4| = 0 \Rightarrow \sum x = ?$

A) –8 B) –5 C) –3 D) 5 E) 8

15.



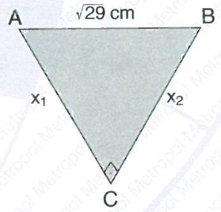
ABCD bir dikdörtgendir. ABCD is a rectangle.

Çevre / The perimeter (ABCD) = 20 cm, A(ABCD) = 21 cm^2,

$3x^2 + tx + (2p - 1) = 0$, $ÇK(SS) = \{x_1, x_2\} \Rightarrow$ **t + p = ?**

A) –7 B) –5 C) –3 D) 2 E) 4

16.



$|BC| = x_2$, $|AC| = x_1$, $[AC] \perp [BC]$,

$p < 0$, $x^2 + (3p + 1)x + 4k = 0$,

$ÇK(SS) = \{x_1, x_2\}$, $A(\widehat{ABC}) = 5\,cm^2 \Rightarrow$ **2k – 3p = ?**

A) 19 B) 17 C) 13 D) 11 E) 8

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	B	A	D	A	E	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	C	E	A	A	C	D	C

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1. $(x^2+x)^2-8x^2-8x+12=0$

$\Rightarrow \prod x = ?$

A) –12 B) –6 C) 6 D) 12 E) 18

2. $x^2-4x+2m-1=0$, $ÇK(SS)=\{x_1,x_2\}$,

$x_1^2-x_2^2=24 \Rightarrow m = ?$

A) –5 B) –4 C) –3 D) –2 E) –1

3. $f(x)=x^2-x\cdot|x-4|-48$,

$f(x_1)=f(x_2)=0 \Rightarrow x_1+x_2 = ?$

A) 8 B) 10 C) 12 D) 14 E) 16

4. $2x+y=6$,

$(3x-y)^2-2\cdot(3x-y)-8=0$

$\Rightarrow \sum y = ?$

A) 6 B) $\frac{31}{5}$ C) $\frac{32}{5}$ D) $\frac{34}{5}$ E) 7

5. $f(x)=x^2-4x+m-3$,

$f(x_1)=f(x_2)=0$, $x_1=3\cdot x_2$

$\Rightarrow m = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

6. $k\in R^+$,

$3x^2+kx-5=0$, $ÇK(SS)=\{x_1,x_2\}$,

$|x_1-x_2|=3 \Rightarrow k = ?$

A) $\sqrt{22}$ B) $2\sqrt{5}$ C) $\sqrt{19}$ D) $3\sqrt{2}$ E) $\sqrt{21}$

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7. $\sqrt[3]{x^2}-6\cdot\sqrt[3]{x}+8=0 \Rightarrow \boldsymbol{\sum x=?}$

A) 6 B) 8 C) 24 D) 64 E) 72

8. $a \in R$,

$a^2+3a+\sqrt{a^2+3a+5}=7$

$\Rightarrow \boldsymbol{a^2+3a+8=?}$

A) 4 B) 8 C) 9 D) 10 E) 12

9. $(a^2+2a)^2-18\cdot(a^2+2a)+45=0$

$\Rightarrow \boldsymbol{\max(a)+\min(a)=?}$

A) −2 B) −1 C) 0 D) 1 E) 2

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10. $f(x)=x^2-4x-3$,

$f(x_1)=f(x_2)=0 \Rightarrow \boldsymbol{|x_1^2-x_2^2|=?}$

A) $4\sqrt{5}$ B) $8\sqrt{5}$ C) $4\sqrt{7}$ D) $8\sqrt{7}$ E) $12\sqrt{7}$

11. $x^2+mx-2x=16$, $ÇK(SS)=\{x_1,x_2\}$,

$x_2=2\cdot x_1^2 \Rightarrow \boldsymbol{m=?}$

A) −4 B) −3 C) −2 D) 2 E) 3

12. $\sqrt{x+34}-x=4 \Rightarrow \boldsymbol{ÇK(SS)=?}$

A) {−9} B) {2} C) {−9,2} D) {2,9} E) {9}

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
D	D	A	C	B	E	E	E	A	D	A	B

1. $\frac{2}{x}+\frac{x}{x+1}+\frac{x-2}{x}=\frac{5}{4}$

$\Rightarrow$ **x = ?**

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) $\frac{3}{4}$ E) $\frac{4}{5}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

2. $\frac{x^2-3x-10}{\left(\frac{2}{x}+1\right)\cdot\left(\frac{5}{x}-1\right)}=?$

A) $-3x$ B) $-x+2$ C) $-x^2$ D) $x+1$ E) $x-5$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3. $2a-\frac{1}{a}=8 \Rightarrow a^2+\frac{1}{4a^2}=?$

A) 68 B) 60 C) 17 D) 15 E) 14

[KARABÜK ÜNİVERSİTESİ – YÖS 2018]

4. $x \in Z^+$,

$\frac{1}{x}-\frac{1}{x+2}=\frac{2}{15} \Rightarrow$ **x = ?**

A) $\frac{1}{5}$ B) $\frac{1}{3}$ C) 3 D) 5 E) $\frac{1}{7}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

5. $a, b \in Z^+$,

$2a^2-3ab-5b^2=0 \Rightarrow$ **min(a + b) = ?**

A) 8 B) 7 C) 6 D) 5 E) 4

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

6. **$y=2x^2+4x-m+3$ fonksiyonu x eksenini kesmediğine göre, m sayısının alabileceği en küçük tam sayı değeri kaçtır?**

If the function $y=2x^2+4x-m+3$ doesn't intersect the x – axis what is the smallest integer value of m?

A) –4 B) –3 C) 2 D) 4 E) 0

[ANADOLU ÜNİVERSİTESİ – YÖS 2017]

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7. $f(x) = x^2 + x + m$

$f(x_1) = f(x_2) = 0$

$x_1 = 2 \cdot x_2 \Rightarrow$ **m = ?**

A) $\frac{2}{3}$ B) $\frac{7}{5}$ C) $\frac{7}{11}$ D) $\frac{3}{4}$ E) $\frac{2}{9}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

8. $f(x) = x^2 - 2mx + 8,$

$f(x_1) = f(x_2) = 0,\ x_1 = {x_2}^2$

$\Rightarrow$ $\mathbf{3x_1 + 2x_2 = ?}$

A) 12 B) 16 C) 18 D) 20 E) 22

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

9. $f(x) = mx^2 + 6x - n$

$f(x_1) = f(x_2) = 0$

$x_1 = x_2 \Rightarrow$ **m · n = ?**

A) −11 B) −10 C) −9 D) −8 E) −7

[İSTANBUL ÜNİVERSİTESİ – YÖS 2014]

10. $f(x) = x^2 - 3x + 5$

$f(x_1) = f(x_2) = 0$

$g\left(\frac{1}{x_1}\right) = g\left(\frac{1}{x_2}\right) = 0 \Rightarrow$ **g(x) = ?**

A) $3x^2 - 5x + 1$

B) $x^2 - 5x + 3$

C) $5x^2 - 3x + 1$

D) $3x^2 + 5x + 3$

E) $5x^2 - x + 2$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2014]

11. $f(x) = 2x^2 - 5x + k$

$f(x_1) = f(x_2) = 0$

$x_1 = \frac{7}{x_2} \Rightarrow \mathbf{\frac{1}{x_1} + \frac{1}{x_2} = ?}$

A) $\frac{5}{7}$ B) $\frac{7}{5}$ C) $\frac{14}{5}$ D) $\frac{5}{14}$ E) $\frac{5}{2}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2014]

12. $x^2 + (m^2 - 16)x - 2 + m = 0$

$x_1 + x_2 = 0 \Rightarrow$ **m = ?**

A) −4 B) −2 C) 0 D) 2 E) 4

[İSTANBUL ÜNİVERSİTESİ – YÖS 2013]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
B	C	C	C	B	E	E	B	C	D	E	A

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BÖLÜM CHAPTER 3

TARİHSEL NOT / HISTORICAL NOTE

GABRIEL CRAMER [1704 - 1752]

İsviçreli matematikçi. 18 yaşında doktorasını aldı ve 20 yaşında Cenevre Üniversitesi'nde matematik başkanlığı yaptı. 1750'de, Cramer'in kuralını yayınladı ve sistem tarafından ima edilen belirleyiciler açısından, benzersiz bir çözüme sahip doğrusal denklem sisteminde herhangi bir bilinmeyenin çözümü için genel bir formül verdi. Bu kural hala standarttır.

Swiss mathematician. He received his doctorate's degree at the age of 18, and at the age of 20, he became the head of mathematics at the University of Geneva. In 1750, he published Cramer's rule and gave a general formula for the solution of any unknown in the system of linear equations with a unique solution, for the determinants implied by the system. This rule is still standard.

İKİNCİ DERECEDEN EŞİTSİZLİKLER
QUADRATIC INEQUALITIES

Bu bölüm 48 alıştırma sorusu, 86 test sorusu, 6 YÖS sorusu içermektedir.
This chapter includes 48 exercise questions, 86 test questions, and 6 YÖS questions.

BÖLÜM / CHAPTER 3

İKİNCİ DERECEDEN EŞİTSİZLİKLER / QUADRATIC INEQUALITIES

- İkinci Dereceden Eşitsizlikler / Quadratic Inequalities .... 71 – 88

İKİNCİ DERECEDEN EŞİTSİZLİKLER
QUADRATIC INEQUALITIES

1. $(x-2)^2 \geq 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is R

2. $(x+3)^2 > 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $R-\{-3\}$

3. $(x+2)^2 < 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\varnothing$

4. $(x+5)^2 \leq 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{-5\}$

5. $x \in Z$,

$(x+3)\cdot(x-1) < 0 \Rightarrow \sum x = ?$

Yanıt / The Answer is –3

6. $x \in Z^-$,

$(x+5)\cdot(x-2)\cdot(1-x) < 0 \Rightarrow \sum x = ?$

Yanıt / The Answer is –10

7. $-x^2 \geq 9x \Rightarrow ? < x < ?$

Yanıt / The Answer is $-9 \leq x \leq 0$

8. $-x^2+4x < 4 \Rightarrow ? < x < ?$

Yanıt / The Answer is $R-\{2\}$

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9. $-x^2 \cdot (x^2-5x+6) > 0 \Rightarrow$ **? < x < ?**

Yanıt / **The Answer is** $2 < x < 3$

10. $x^2 \cdot (x^2-3x-10) < 0 \Rightarrow$ **? < x < ?**

Yanıt / **The Answer is** $(-2,5)-\{0\}$

11. $x^2-x+1 > 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is** R

12. $x^2-x+6 < 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is** Ø

13. $(x^2+3x-10)^2 \cdot (x-2)^3 < 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is** $(-\infty,2)-\{-5\}$

14. $\frac{x-1}{x+3} < 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is** $(-3,1)$

15. $\frac{x+1}{x-1} < -3 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is** $\left(\frac{1}{2},1\right)$

16. $x \leq \frac{1}{x} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is** $(-\infty,-1]\cup(0,1]$

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17. $x < \frac{4}{x} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(-\infty,-2)\cup(0,2)$

18. $(x+1)\cdot(x^2-1) > 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(1,\infty)$

19. $\frac{(x-2)\cdot(x+1)}{x-4} < 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(-\infty,-1)\cup(2,4)$

20. $\frac{(3-x)^{15}\cdot(x-1)^5}{(x+2)^4} \geq 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $[1,3]$

21. $\frac{(1-x^2)\cdot(x^2+2x-3)}{x^2+1} \geq 0,$

$x \in Z \Rightarrow \sum x = ?$

Yanıt / The Answer is –5

22. $\frac{(x-1)\cdot(x^2-2x-3)}{-x+1} \geq 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $[-1,3]-\{1\}$

23. $\frac{5^x\cdot(x-2)}{3-x} \leq 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(-\infty,2]\cup(3,\infty)$

24. $\left(\frac{3}{7}\right)^{x^2+3} > \left(\frac{7}{3}\right)^{-4x} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(1,3)$

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25. $x \in Z$,
$\sqrt{x+3}\cdot(3x-6) < 0 \Rightarrow \sum x = ?$

Yanıt / The Answer is –2

26. $x^2+1 < x+3 < x^2-3 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is Ø

27. $\left.\begin{matrix} x\cdot(x-3) < 0 \\ x-1 > 0 \end{matrix}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(1,3)$

28. $x \in Z^+,\ -2 \le x^2-2x-5 \le 10$
$\Rightarrow$ **min(x) = ?**

Yanıt / The Answer is 3

29. $\dfrac{|x-5|\cdot(x^3-9x)}{(x^2+x+5)\cdot(x-2)} \le 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $[-3,0]\cup(2,3]\cup\{5\}$

30. $x < 7\sqrt{x}-12 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(9,16)$

31. $\left.\begin{matrix} 4x-x^2 \ge 0 \\ \dfrac{x-2}{x+1} \le 0 \end{matrix}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $[0,2]$

32. $x < \dfrac{16}{x} < 4 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(-\infty,-4)$

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33. $x \in Z,\ \dfrac{(x^2-x-12)\cdot(x^2+5x+8)}{x^2+4x+4} \geq 0$

$\Rightarrow \sum x = ?$

Yanıt / The Answer is –3

34. $\dfrac{(1-x^2)\cdot(x^2-4)}{(x-1)^2} > 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(-2,-1)\cup(1,2)$

35. $\dfrac{x}{x-1} \geq \dfrac{1}{x-1} - 2x + 3 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(1,\infty)$

36. $\left.\begin{array}{l} \dfrac{-2}{-x^2+7x-10} < 0 \\ (4-x)\cdot(x+1) \geq 0 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(2,4]$

37. $\dfrac{x^2\cdot(4-x)^7}{x^2-x-2} \geq 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(-\infty,-1)\cup(2,4]\cup\{0\}$

38. $\dfrac{2^{-x+1}\cdot(x-6)}{|x-3|\cdot\sqrt{x-2}} \leq 0,$

$x \in Z \Rightarrow \sum x = ?$

Yanıt / The Answer is 15

39. $\left.\begin{array}{l} x^2-3x-4 < 0 \\ -x^2+4x+12 \geq 0 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(-1,4)$

40. $(m-2)x^2-2x+m+3=0$, ÇK(SS) $=\{x_1, x_2\}$,

$x_1 < 0 < x_2 \Rightarrow$ **? < m < ?**

Yanıt / The Answer is $-3 < m < 2$

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41. $m \in Z^{+}$, $mx^2+3x-4+m=0$,

$ÇK(SS)=\{x_1, x_2\}$, $x_1 < x_2 < 0$

$\Rightarrow$ **min(m) = ?**

Yanıt / The Answer is 5

42. $\dfrac{x}{x+2} \le \dfrac{1}{x} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(-2,-1]\cup(0,2]$

43. $\left.\begin{array}{l} x\cdot(3-x) > 0 \\ (2x+1)\cdot(x-2) < 0 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(0,2)$

44. $\dfrac{3x+1}{(x+1)^2} > 1 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(0,1)$

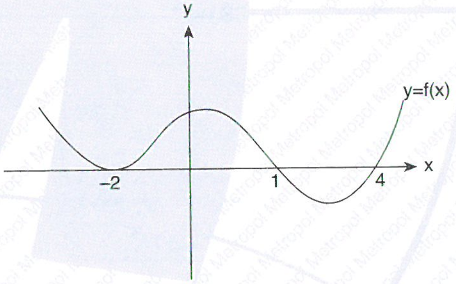
45. $\dfrac{(x^6-1)\cdot(x^4+1)}{x^2\cdot(x^2-4)} < 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(-2,-1)\cup(1,2)$

46. $\left.\begin{array}{l} x^2+2x+1 \ge 0 \\ x^2-2x-3 < 0 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $(-1,3)$

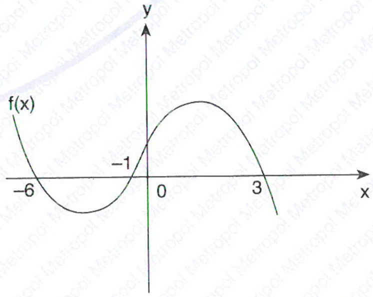
47.



$x \in Z$ ve (and) $f(x) \le 0 \Rightarrow \sum x = ?$

Yanıt / The Answer is 8

48.



$(x-1)\cdot f(x) \ge 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $[-6,-1]\cup[1,3]$

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1. $x^2 < 2x + 3 \Rightarrow$ **ÇK(SS) = ?**

A) $3 < x < 4$
B) $-1 < x < 3$
C) $-3 < x < -2$
D) $-2 < x < -1$
E) $4 < x < 5$

2. $x \in Z$,

$2x - 3 \leq x + 2 < 3x - 1 \Rightarrow \sum x = ?$

A) 9 B) 10 C) 12 D) 14 E) 16

3. $x \in Z$,

$3x + 2 \leq x + 17 \leq 4x - 1$

$\Rightarrow \sum x = ?$

A) 10 B) 13 C) 16 D) 19 E) 22

4. $x \in Z$,

$\frac{x}{6} > \frac{4}{x} \Rightarrow \min(x) = ?$

A) –5 B) –4 C) 3 D) 4 E) 5

5. $x \in R^+$,

$\frac{3}{x} > \frac{x}{3} \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, 0)$
B) $(-3, 3)$
C) $(-3, 0)$
D) $(3, \infty)$
E) $(0, 3)$

6. $x \in Z$,

$(x+2)\cdot(3-x) > 0 \Rightarrow \sum x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

7. $x \in Z$,

$\frac{2x-9}{x+4} \leq 0 \Rightarrow \sum x = ?$

A) 8 B) 7 C) 6 D) 4 E) 3

8. $\frac{x}{x-2} < \frac{1}{x+2} \Rightarrow$ **ÇK(SS) = ?**

A) $(-2, 2)$
B) $(-1, 2)$
C) $(-2, 3)$
D) $(1, 2)$
E) $(2, 3)$

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9. $x\cdot(x^2-3x-4)\geq 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -1) \cup [0, \infty)$
B) $(-1, 4]$
C) $[-1, 0] \cup [4, \infty)$
D) $(-\infty, -1] \cup [0, 4]$
E) $(-\infty, -1) \cup [4, \infty)$

10. $\frac{3x}{x^2-1}\leq 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -1) \cup [0, 1)$
B) $(-\infty, -1] \cup [0, 1)$
C) $(-\infty, -1) \cup [0, 1]$
D) $(-\infty, -1] \cup (0, 1)$
E) $(-\infty, -1)$

11. $x \in R^+$,

$\frac{x^2-4x}{(1+x)\cdot(4-x^2)}\geq 0 \Rightarrow$ **ÇK(SS) = ?**

A) $[0, 1]$ B) $[1, 2]$ C) $[1, 4]$
D) $[2, 4]$ E) $(2, 4]$

12. $12\geq x^2+x \Rightarrow$ **ÇK(SS) = ?**

A) $[-4,3]$ B) $(0,6)$ C) $(-\infty,3)$
D) $(-4,\infty)$ E) $(-4,0)$

13. $\left(\frac{1}{2}\right)^{x^2}\geqslant(0,5)^{2x}$,

$x\in Z \Rightarrow \prod x = ?$

A) 3 B) 2 C) 0 D) –2 E) –3

14. $x\in Z$,

$\frac{(x-3)\cdot(x-1)^6}{x-3}>0 \Rightarrow \sum x = ?$

A) –4 B) 0 C) 1 D) 2 E) 3

15. $\frac{2}{x+1}-\frac{1}{1-x}>1 \Rightarrow$ **ÇK(SS) = ?**

A) $(1, \infty)$ B) $(1, 2)$ C) $(-1, 1)$
D) $(0, 3)$ E) $(-1, 0) \cup (1, 3)$

16. $\frac{2x^2}{x^2+x+1}<2 \Rightarrow$ **ÇK(SS) = ?**

A) $(-1, \infty)$ B) $(-\infty, -1)$ C) $(1, \infty)$
D) $(-1, 0)$ E) $(-1, 1)$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	D	B	B	E	B	D	A
9	10	11	12	13	14	15	16
C	A	E	A	C	A	E	A

METROPOL YAYINLARI • METROPOL PUBLICATIONS

1. $x \in Z$,

$(x-3)^2 \cdot (x+3) \cdot (5-x) > 0 \Rightarrow \sum x = ?$

A) 7 B) 6 C) 5 D) 4 E) 3

2. $x \in Z^+$,

$(x^4+7) \cdot (3x-11) < 0 \Rightarrow \sum x = ?$

A) 3 B) 4 C) 5 D) 6 E) 8

3. $(x-4) \cdot (x+1) \cdot (x-1)^2 < 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty,1) \cup (1,4)$ B) $(1, \infty)$ C) $(-1,4)$ D) $(0,4)$ E) $(-1,1) \cup (1,4)$

4. $\dfrac{x^2 \cdot (1-x)}{x^3-1} > 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, 0)$ B) $(-\infty, 1)$ C) $(0, \infty)$ D) R E) ∅

5. $\dfrac{8-x^3}{x^3+8} > 0 \Rightarrow$ **ÇK(SS) = ?**

A) $-2 < x < 2$ B) $-1 < x < 3$ C) $2 > x$ D) $x \geq 3$ E) $R - [-2, 2]$

6. $x \in Z^+$,

$\dfrac{x^2+4x}{x+4} \leq 8 \Rightarrow \sum x = ?$

A) 4 B) 8 C) 10 D) 13 E) 36

7. $x \in Z$,

$\dfrac{(x+3) \cdot (2-x)^3}{(x-1)^2} \geqslant 0 \Rightarrow \sum x = ?$

A) – 4 B) – 3 C) – 2 D) 0 E) 2

8. $\dfrac{x^2-8x+16}{x+2} \leq 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-2, 4)$ B) $[4, \infty)$ C) $(-\infty, 4]$ D) $(2, 4]$ E) $(-\infty, -2) \cup \{4\}$

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9. $\dfrac{(2-x)^2-(x-2)}{x+1} \le 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -1) \cup [2, 3]$
B) $(-\infty, -1] \cup (2, 3)$
C) $(-\infty, -1) \cup (2, 3)$
D) $(-\infty, -1] \cup [2, 3)$
E) $(-\infty, -1] \cup (2, 3]$

10. $\dfrac{x\cdot(x^2-x+3)}{-x^2+2x-4} < 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(0, \infty)$ B) $(0, 1)$ C) $(1, 2)$
D) $(0, 2)$ E) $(2, \infty)$

11. $\dfrac{(x+2)\cdot(x^2-2x+1)}{(3-x)} > 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-2, 1)$ B) $(-2, 3)$ C) $(-2, 1) \cup \{3\}$
D) $(-2, 3) - \{1\}$ E) $(1, 3) - \{2\}$

12. $x \in Z$,
$\dfrac{(3x-12)\cdot(-x^2-4)}{(x+2)^3} \ge 0 \Rightarrow \sum x = ?$

A) 7 B) 9 C) 10 D) 12 E) 14

13. $\dfrac{x^2-4x+4}{x^2-2x-15} < 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-3, 2)$ B) $(2, 5)$
C) $(-3, 5) - \{2\}$ D) $(-\infty, -3) \cup (2, 5)$
E) $(-2, 1) \cup (3, \infty)$

14. $x \in Z^-$,
$\dfrac{-(x+3)\cdot(x+6)^2}{x} > 0 \Rightarrow$ **$\min(x) = ?$**

A) –6 B) –4 C) –3 D) –2 E) –1

15. $x \in Z$,
$\dfrac{(3-x)\cdot(x-8)}{x^2-8x+16} \ge 0 \Rightarrow \sum x = ?$

A) 33 B) 32 C) 30 D) 29 E) 28

16. $x \in Z$,
$\dfrac{-(x+2)^2\cdot(x+4)}{(x-4)} > 0 \Rightarrow$ **$\max(x) = ?$**

A) –1 B) 0 C) 1 D) 2 E) 3

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	D	E	E	A	E	A	E
9	10	11	12	13	14	15	16
A	A	D	B	C	D	D	E

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1. $x \in Z^+$,

$x - \frac{4}{x+1} < 2 \Rightarrow \sum x = ?$

A) 3 B) 2 C) 1 D) 0 E) 10

2. $x \in Z$,

$7^x \cdot (5x - x^2) \leq 0 \Rightarrow \sum x = ?$

A) –12 B) –11 C) –10 D) –8 E) –5

3. $\left.\begin{array}{l} \frac{x-3}{4-x^2} > 0 \\ (x+2)\cdot(x-4) < 0 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -2)$ B) $(-2, 2)$ C) $(2, 3)$ D) $(2, 4)$ E) $(3, 4)$

4. $x \in Z$,

$\frac{(x-2)\cdot(9-x^2)}{x^5} \geq 0 \Rightarrow$ **max(x) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $\frac{(2-x)^3}{(x-1)^4} < 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, 1)$ B) $(1, 2)$ C) $(2, \infty)$ D) $(-2, 1)$ E) $(0, 2)$

6. $x \in Z$,

$\left.\begin{array}{l} x^2 - x - 6 < 0 \\ x^2 + 4x + 3 > 0 \end{array}\right\} \Rightarrow \sum x = ?$

A) –1 B) 1 C) 2 D) 3 E) 4

7. $4^x - 5 \cdot 2^x + 4 < 0$

$\Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -2)$ B) $(0, 2)$ C) $(-2, 0)$ D) $(4, \infty)$ E) $(2, 4)$

8. $A \in R$, $x \in Z^+$,

$A = \sqrt{\frac{-3}{x^2 \cdot (x-7)}} \Rightarrow \sum x = ?$

A) 21 B) 23 C) 25 D) 28 E) 30

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9. $\sqrt{x-1} > 3-x \Rightarrow$ **? < x < ?**

A) $x > 5$ B) $x < -5$ C) $1 \le x < 2$ D) $2 < x < 5$ E) $x > 0$

10. $x \in Z$,

$\sqrt{x^2+3x-4} < 6 \Rightarrow \sum x = ?$

A) –12 B) –16 C) –21 D) –25 E) –27

11. $\sqrt{x^2-2x+1} \le 6 \Rightarrow \sum x = ?$

A) 6 B) 13 C) 18 D) 26 E) 28

12. $x \in Z$,

$\sqrt{x+2}\cdot(3x-15) \le 0 \Rightarrow \sum x = ?$

A) 6 B) 8 C) 9 D) 10 E) 12

13. $\forall x \in R$,

$x^2 + x + m > x + 1 \Rightarrow$ **? < m < ?**

A) $m < 0$ B) $m < 1$ C) $1 < m$ D) $0 < m$ E) $0 < m < 1$

14. $x \in Z$,

$\dfrac{|x-3|\cdot(x^2-4x-5)}{x^2-x+2} \le 0 \Rightarrow \sum x = ?$

A) 11 B) 13 C) 14 D) 15 E) 16

15. $x \in Z$,

$\dfrac{(2-x)^{1881}\cdot(x-1)^{1938}}{(x+1)^{55}\cdot(x^2-9)} \ge 0 \Rightarrow \sum x = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

16. $\dfrac{(x-1)^{2013}\cdot(x-x^2)^{1938}}{(x^2-4x+3)^{1995}} > 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(0, \infty)$ B) $(-\infty, 3)$ C) $(3, \infty)$ D) $(1, 3)$ E) $(0, 3)$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	C	C	C	C	D	B	A
9	10	11	12	13	14	15	16
D	A	B	E	C	C	D	C

1. $x^2 - 2x - 3 < 0 \Rightarrow$ **? < x < ?**

A) $2 < x$ B) $-2 < x < 3$ C) $x < 3$
D) $-1 < x$ E) $-1 < x < 3$

2. $(x^2 - 3x)\cdot(-x^2 + x) > 0 \Rightarrow$ **? < x < ?**

A) $-1 < x < 0$ B) $0 < x$ C) $x < 2$
D) $x < 3$ E) $1 < x < 3$

3. $x > 0, \ \frac{x^2 - x}{2 - x} > 0 \Rightarrow$ **? < x < ?**

A) $1 < x < 2$ B) $x > 2$ C) $x > 1$
D) $x < 3$ E) $0 < x < 2$

4. $\frac{(2-x)\cdot(x^2+4x-5)}{x+5} \geq 0 \Rightarrow$ **ÇK(SS) = ?**

A) $R - [1,2]$ B) $R - (1,2)$ C) $[-5,2]$
D) $(-5,2]$ E) $[1,2]$

5. $\frac{(x-2)\cdot(x^2+5x+4)}{x^2+1} < 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -1)$ B) $(-\infty, -4)$ C) $(-\infty, 2) - \{0\}$
D) $(-\infty, -4) \cup (-1,2)$ E) $(-1,2) - \{1\}$

6. $\frac{x\cdot(2-x)^2}{x+1} \leq 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-1, 0]$ B) $(-1, 0] \cup \{2\}$ C) $\{2\}$
D) $\varnothing$ E) $\{0\}$

7. $x \in Z$,
$\frac{(1-x)^2\cdot(x-3)}{5-x} \geq 0 \Rightarrow \sum x = ?$

A) 3 B) 5 C) 8 D) 11 E) 18

8. $\frac{(4-x^2)\cdot(x-3)}{x^2+4x+4} > 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, 2)$ B) $(-\infty, 3)$ C) $(2,\infty)$
D) $(-\infty, -2) \cup \{2\}$ E) $(-\infty, -2) \cup (2,3)$

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9. $\dfrac{x^2-4x+4}{x^2+6x+9} \geq 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\varnothing$ B) R C) R – {–3} D) R – {2} E) {–3, 2}

10. $x \in Z$,

$\dfrac{4x^2-5x+1}{x^2-x-2} \leq 0 \Rightarrow \sum x = ?$

A) $\frac{1}{2}$ B) $\frac{3}{2}$ C) 1 D) 4 E) 7

11. $\dfrac{(x-1)^{2019}\cdot(x-x^2)^{2018}}{(x^2-4x+3)^{1995}} > 0 \Rightarrow$ **ÇK(SS) = ?**

A) (1,∞) B) (0, ∞) C) (1,3) D) (3, ∞) E) R – (1, 3)

12. $\dfrac{(x+1)^{1919}\cdot(x-1)^{1923}}{(x^2-1)^{1881}\cdot(x+3)^{1938}} < 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\varnothing$ B) R – {1} C) R – {–3,1} D) {–1} E) R

13. $x \in Z$,

$\dfrac{(x^2-2x+1)\cdot(x^2-5x+6)}{x^2-16} < 0 \Rightarrow \sum x = ?$

A) –4 B) –6 C) –16 D) –24 E) –44

14. $x \in Z$,

$\dfrac{(-x^2-4)\cdot(x^2+3x+2)}{x^2+x-20} \geq 0 \Rightarrow \sum x = ?$

A) –4 B) –5 C) –11 D) 0 E) 4

15. $x \in Z$,

$\dfrac{|x-3|\cdot(2-x)}{x^4\cdot(x^3-8)} \leq 0 \Rightarrow \sum x = ?$

A) –8 B) –2 C) 2 D) 8 E) 12

16. $x \in N$,

$\dfrac{x^2+x-30}{|x-5|+1} \leq 0 \Rightarrow \sum x = ?$

A) 35 B) 15 C) 13 D) 9 E) 5

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	E	A	E	D	B	C	E
9	10	11	12	13	14	15	16
C	C	D	A	B	A	B	B

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1. $x \in Z$,

$\left.\begin{array}{l} x^2-2x-8 \le 0 \\ -x^2+9>0 \end{array}\right\} \Rightarrow \sum x = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

2. $x^2 - x - 20 < 0$,

$x^2 + 6x + 5 < 0 \Rightarrow$ **ÇK(SS) = ?**

A) (–5, –4) B) (–4, –1) C) (–1, 5) D) (–5, –1) E) (–4, 5)

3. $x \cdot (3 - x) > 0$, $(2x + 1) \cdot (x - 2) < 0$,

ÇK(SS) = (a, b) $\Rightarrow$ **a – b = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

4. $x \in Z^+$,

$x^3-3x^2-x+3 \le 0 \Rightarrow \sum x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

5. $2 < x^2 + x < 6 \Rightarrow$ **x = ?**

A) $-2 < x < 2$

B) $2 < x$

C) $-1 < x < 2$

D) $-3 < x < -2 \cup (1,2)$

E) $x < -3$

6. $x \in Z$,

$|x^2+2x+1| < 4 \Rightarrow \sum x = ?$

A) –2 B) –3 C) –4 D) –5 E) –7

7. $x \in Z$,

$6x - \frac{5}{2} \ge \frac{13}{2} + 3x \Rightarrow \min(x) = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $f(x) = \sqrt{1 - \frac{2x-8}{x-2}} \Rightarrow$ **ÇK(SS) = ?**

A) (2,4) B) (3,4] C) (2,6) D) (2,6] E) (2,8)

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9. $x \in Z$,

$\dfrac{|x-2|}{x^2-9} < 0 \Rightarrow \sum x = ?$

A) –3 B) –2 C) 0 D) 2 E) 3

10. $x \in Z$,

$\dfrac{|x+2| \cdot (4-x)}{x-2} \geq 0 \Rightarrow \sum x = ?$

A) 4 B) 5 C) 7 D) 12 E) 14

11. $x \in R^+$,

$\dfrac{|-x+3| \cdot (x^5-1)}{x^2-9} \leq 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -3)$ B) $(-\infty, 1]$ C) $(-3, 1]$ D) $[1, 3)$ E) $(3, \infty)$

12. $x \in Z$,

$\dfrac{|x-3| \cdot (x^2-5x-6)}{(x-2)^2} < 0 \Rightarrow \sum x = ?$

A) 10 B) 11 C) 13 D) 14 E) 15

13. $m \in Z$, $x_1 \neq x_2$,

ÇK(SS) = $\{x_1, x_2\}$, $(m+1) \cdot x^2 + 2(m+1) \cdot x + 3m - 2 = 0$

$\Rightarrow \sum m = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

14. $(m^2-1)x^2 + (m+2)x + m^2 + 2m - 3 = 0$,

ÇK(SS) = $\{x_1, x_2\}$, $x_1 < 0 < x_2 \Rightarrow$ **? < m < ?**

A) (–5, –3) B) (–5, –1) C) (–5, 1) D) (–3, 1) E) (–3, –1)

15. $m \in Z$, $|x_1| < x_2$, $x_1 < 0 < x_2$,

$(m+4)x^2 - 3(m-2)x - m + 5 = 0$,

ÇK(SS) = $\{x_1, x_2\} \Rightarrow \sum m = ?$

A) –5 B) –4 C) 4 D) 5 E) 7

16. $\forall x \in R$,

$(m-1)x^2 - 2x + 5 > 4 \Rightarrow$ **? > m > ?**

A) $1 < m < 2$ B) $m > 2$ C) $m < 1$ D) $m > 1$ E) $m < 2$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	A	E	D	B	C	D
9	10	11	12	13	14	15	16
B	B	D	A	A	E	A	B

1. $x \in Z$,

$$\frac{(x+2)^2 \cdot (x+4)^4 \cdot 3^x}{x^2+x+2} \le 0 \Rightarrow \sum x = ?$$

A) –16 B) –12 C) –10 D) –6 E) –4

2. $x \in Z$,

$$\frac{(x^2-4) \cdot |x-1|}{(x+1)^{2018} \cdot (x^2-x-2)} \le 0 \Rightarrow \sum x = ?$$

A) –3 B) –2 C) –1 D) 1 E) 2

3. $y = f(x) = \sqrt{\frac{4}{x-1} - \frac{6}{x+2}}$, $x \in Z^+$

$\Rightarrow \sum x = ?$

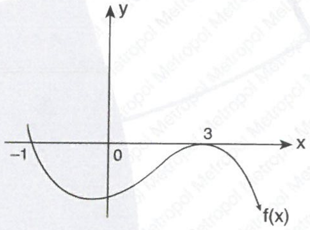
A) 33 B) 30 C) 27 D) 24 E) 21

4. $x^2+(m-3)x+m^2-9=0$, $ÇK(SS)=\{x_1, x_2\}$,

$x_1 < 0 < x_2$, $|x_1| < x_2 \Rightarrow m = ?$

A) $(-\infty, 3)$ B) $(3, \infty)$ C) $(-3, 3)$ D) $(-3, -1)$ E) $(1, 3)$

5.



$$(x+1) \cdot f(x) \le 0 \Rightarrow ÇK(SS) = ?$$

A) $\varnothing$ B) R C) $\{-1\}$ D) $[-1, 3]$ E) $[3, \infty) \cup \{-1\}$

6. $m \in Z$,

$\forall x \in R$ için (for), $x^2-(m+2)x+7>0$

$\Rightarrow$ **max(m) = ?**

A) 7 B) 1 C) 5 D) 2 E) 3

YANITLAR / ANSWERS

1	2	3	4	5	6
D	C	C	C	B	E

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1. $\dfrac{(x^2+x+4)\cdot(x-1)}{x^2-4} < 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty,-2) \cup (2,\infty)$

B) $(2,\infty)$

C) $(-2,2)$

D) $(-\infty,-2) \cup (1,2)$

E) $(-2,1) \cup (2,\infty)$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

2. $\dfrac{(x^2-4)\cdot(x+3)}{|x+4|} \geq 0 \Rightarrow$ **ÇK(SS) = ?**

A) R

B) $[-3,-2]$

C) $[-3,-2] \cup [2,\infty)$

D) $[-3,2] \cup [2,\infty) \cup \{-4\}$

E) $\varnothing$

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

3. $\dfrac{x^2-3x-4}{(x+1)^2} < 0 \Rightarrow$ **? < x < ?**

A) $-4 < x < 1$

B) $0 < x < 4$

C) $-1 < x < 1$

D) $-1 < x < 4$

E) $1 < x < 4$

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

4. $f(x)=\sqrt{5-|x+2|} \Rightarrow$ **ÇK(SS) = ?**

A) $[-2,5]$ B) $(-2,5)$ C) $(-7,7)$

D) $[-7,3]$ E) $[-3,3]$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

5. $4^{2-\frac{x}{2}} \leq 1 \leq 3^{6-x}$ ve (and) $x \in Z \Rightarrow$ **$\sum x = ?$**

A) 5 B) 10 C) 15 D) 20 E) 25

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

6. $f(x)=\sqrt{4-x^2} \Rightarrow$ **ÇK(SS) = ?**

A) $R-\{-4\}$

B) $R-\{-4,4\}$

C) $R-\{-1\}$

D) $[-4,4]$

E) $[-2,2]$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2012]

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YANITLAR / ANSWERS

1	2	3	4	5	6
D	C	D	D	C	E

BÖLÜM CHAPTER 4

TARİHSEL NOT / HISTORICAL NOTE

HÂRİZMÎ [850-780 BC]

El-Harezmi'nin hayatına dair kesin olarak bilinen ayrıntı az sayıdadır. İranlı bir ailede Büyük Horasan'ın Harezm şehrinde (modern Hive,Harezm bölgesi,Özbekistan) doğmuştur. Matematik, coğrafya, astronomi ve haritacılığa katkısı, cebir ve trigonometride yeniliğin temelini oluşturdu. Doğrusal ve ikinci dereceden denklemleri çözmeye yönelik sistematik yaklaşımıyla cebrin ortaya çıkmasına neden olan kitabının başlığı şöyledir, "Tamamlama ve Dengeleme ile Hesaplama Üzerine Özlü Kitap".

There is only a small number of known facts about Al-Khwarezmi's life. He was born in an Iranian family in Harezm city of Horasan (modern Hive, Harezm region, Uzbekistan). He has contribution to mathematics, geography, astronomy and cartography and constituted the basis of innovation in algebra and trigonometry. The title of his book, which leads to the emergence of algebra with the systematic approach to solve linear and quadratic equations, is as follows: "The Compendious Book on Calculation by Completion and Balancing".

İKİNCİ DERECEDEN FONKSİYONLAR
QUADRATIC FUNCTIONS

Bu bölüm 32 alıştırma sorusu, 78 test sorusu, 6 YÖS sorusu içermektedir.

This chapter includes 32 exercise questions, 78 test questions, and 6 YÖS questions.

BÖLÜM / CHAPTER 4

İKİNCİ DERECEDEN FONKSİYONLAR / QUADRATIC FUNCTIONS

- İkinci Dereceden Fonksiyonlar / Quadratic Functions .... 91 – 108

İKİNCİ DERECEDEN FONKSİYONLAR
QUADRATIC FUNCTIONS

1. $f(x) = x^2 - 4x + 3 \Rightarrow \min(f(x)) = ?$

Yanıt / The Answer is –1

2. $f(x) = -x^2 + 5x - 6 \Rightarrow \max(f(x)) = ?$

Yanıt / The Answer is $\frac{1}{4}$

3. $f(x) = -x^2 + 8x + n,$

$\max(f(x)) = 3 \Rightarrow n = ?$

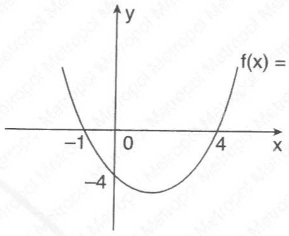
Yanıt / The Answer is –13

4. $f(x) = x^2 + 2x + 1,$

$T(r,k) \Rightarrow r \cdot k = ?$

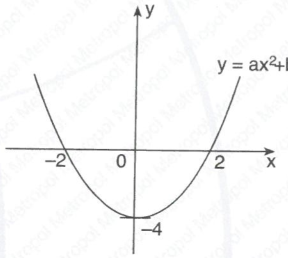
Yanıt / The Answer is 0

5. $f(x) = ?$



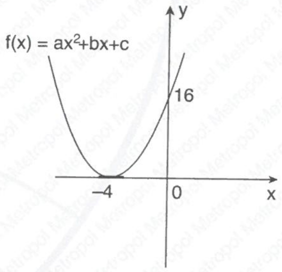
Yanıt / The Answer is $f(x) = (x+1) \cdot (x-4)$

6. $a + b + c = ?$



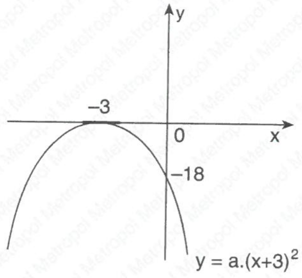
Yanıt / The Answer is –3

7. $f(x) = ?$



Yanıt / The Answer is $f(x) = (x+4)^2$

8. $a = ?$



Yanıt / The Answer is –2

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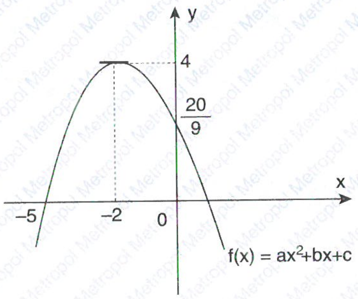
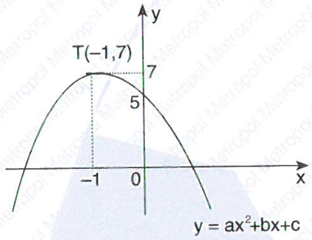
9. c = ?



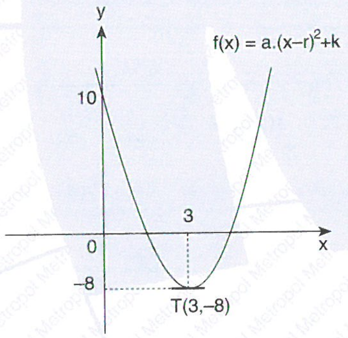
Yanıt / The Answer is $\frac{20}{9}$

10. c = ?



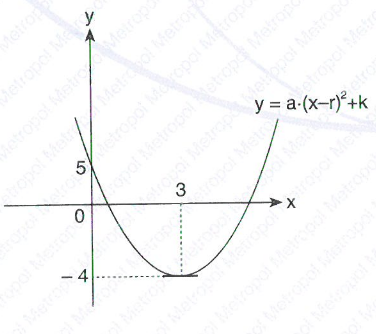
Yanıt / The Answer is 5

11. f(x) = ?



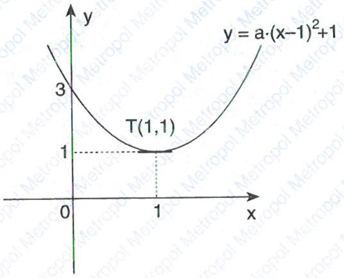
Yanıt / The Answer is $f(x) = 2\cdot(x-3)^2-8$

12. r – k = ?



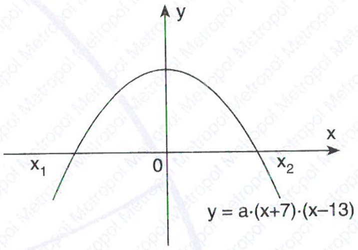
Yanıt / The Answer is 7

13. a = ?



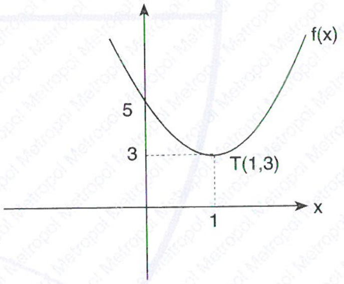
Yanıt / The Answer is 2

14. $\frac{x_1}{x_2} = ?$



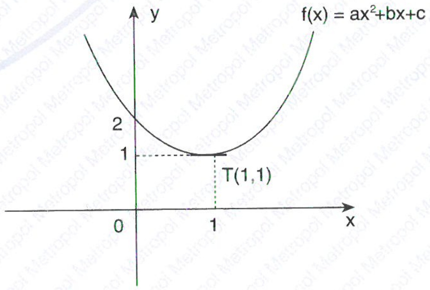
Yanıt / The Answer is $-\frac{7}{13}$

15. f(x) = ?



Yanıt / The Answer is $2x^2-4x+5$

16. a + b + c = ?



Yanıt / The Answer is 1

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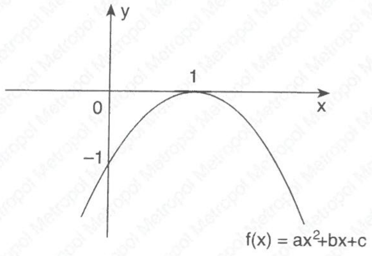
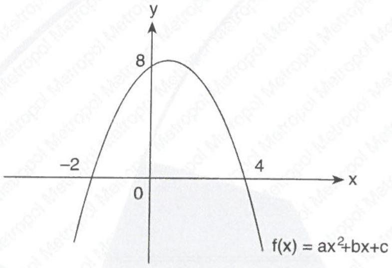
17. $a \cdot b \cdot c = ?$



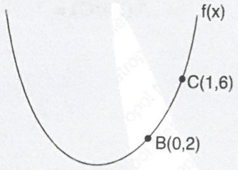
Yanıt / The Answer is 2

18. $a + b - c = ?$



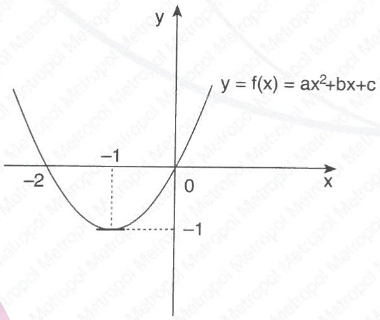
Yanıt / The Answer is −7

19. $f(x) = x^2 + bx + c = ?$



Yanıt / The Answer is $f(x) = x^2 + 3x + 2$

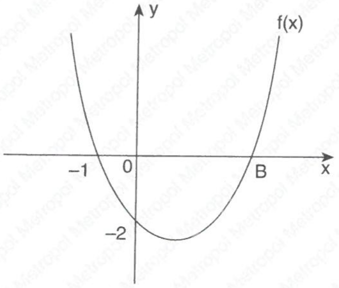
20. $f(-3) + f(1) = ?$



Yanıt / The Answer is 6

21. $f(x) = x^2 + bx + c$

$\Rightarrow$ **B(x,y) = ?**

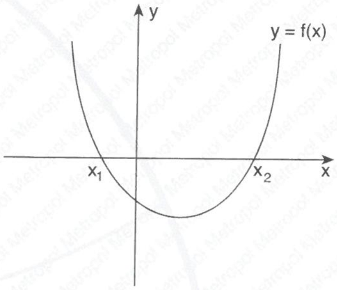


Yanıt / The Answer is (2,0)

22. $y = x^2 - (m-1)x + m^2 - 9$,

$|x_1| < x_2$

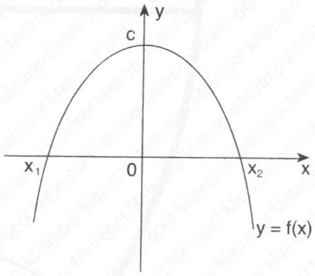
$\Rightarrow$ **? < m < ?**



Yanıt / The Answer is (1,3)

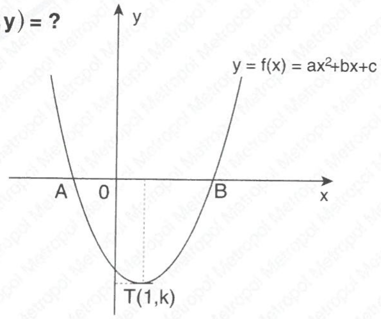
23. $y = -x^2 - (m+2)x - 2m + 8$,

$|x_1| = x_2 \Rightarrow$ **c = ?**



Yanıt / The Answer is 12

24. $|OB| = 3 \cdot |AO| \Rightarrow$ **B(x,y) = ?**



Yanıt / The Answer is (3,0)

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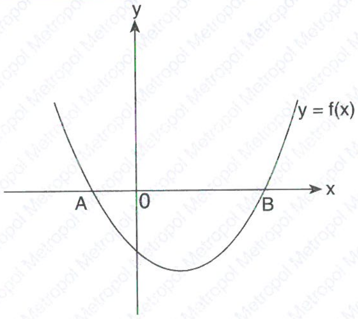
25. $y = x^2 + kx - 12$,

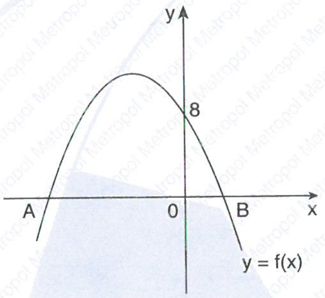
$3 \cdot |AO| = |OB| \Rightarrow$ **k = ?**



Yanıt / The Answer is -4

26. $y = -x^2 + bx + c$

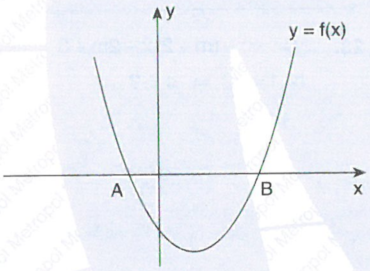
$|AO| = 2 \cdot |OB| \Rightarrow$ **b = ?**



Yanıt / The Answer is -2

27. $y = x^2 + 4x - a + 2$,

$|AB| = 8 \Rightarrow$ **a = ?**

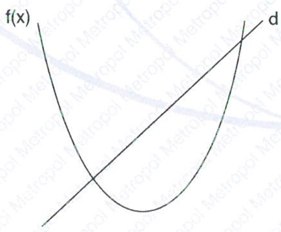


Yanıt / The Answer is 14

28. $f(x) = x^2 - 4x + 3$,

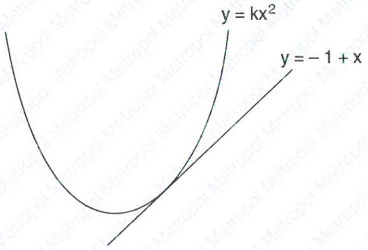
$d: y = -x + k - 1$

$\Rightarrow$ **? < k < ?**



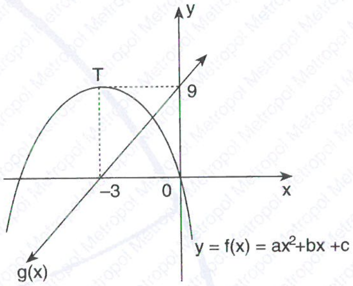
Yanıt / The Answer is $\frac{7}{4} < k < \infty$

29. **k = ?**



Yanıt / The Answer is $\frac{1}{4}$

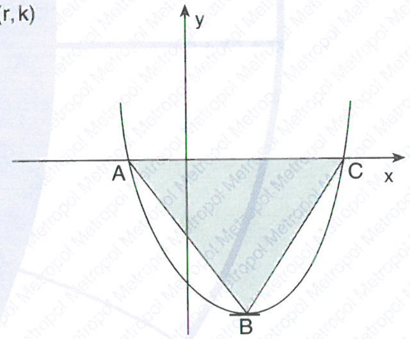
30. $(gof)(-1) = ?$



Yanıt / The Answer is 24

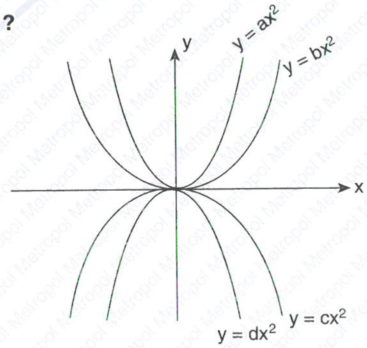
31. $y = x^2 - 3x - 4$, $B = T(r, k)$

$\Rightarrow$ **$A(\widehat{ABC})$ = ?**



Yanıt / The Answer is $\frac{125}{8}$

32. $|b - a| + |a - c| + |d - b| = ?$



Yanıt / The Answer is $2a - c - d$

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1. $y = f(x) = x^2 - x - 2$

$\Rightarrow$ **min(y) = ?**

A) –1 B) $-\frac{3}{2}$ C) $-\frac{9}{4}$ D) –3 E) –4

2. $y = 2x^2 + 3x - 2$

$\Rightarrow$ **min(y) = ?**

A) –5 B) –6 C) $-\frac{25}{8}$ D) –7 E) $-\frac{29}{5}$

3. $f(x) = 3x^2 - 6x + 5$

$\Rightarrow$ **min(f(x)) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $f(x) = -x^2 - 2x + m - 1$,

$\max(f(x)) = 4 \Rightarrow$ **m = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $A = 2x - 12$

$B = -2x + 24$

$\Rightarrow$ **max(A · B) = ?**

A) 20 B) 32 C) 36 D) 40 E) 42

6. $f(x) = mx^2 - (2m - 8)x + 1$,

$T(r, k) = (-1, k)$

$\Rightarrow$ **m = ?**

A) –3 B) –1 C) 1 D) 2 E) 3

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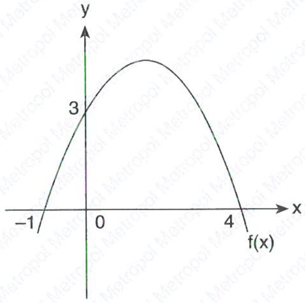
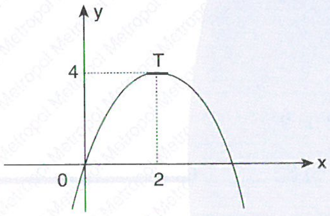
7.



$y = f(x) = ax^2 + bx + c \Rightarrow \mathbf{f(1) = ?}$

A) $\frac{5}{2}$ B) 3 C) $\frac{7}{2}$ D) 4 E) $\frac{9}{2}$

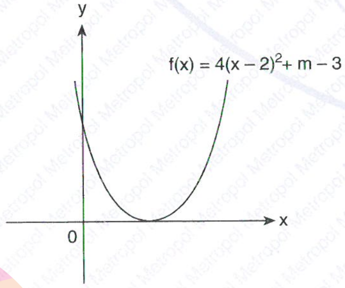
8.



$T(2,4),\ y = f(x) = ax^2 + bx + c \Rightarrow \mathbf{f(1) = ?}$

A) 1 B) $\frac{5}{2}$ C) 3 D) $\frac{7}{2}$ E) 4

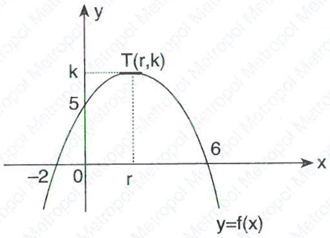
9.



$\Rightarrow$ **m = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

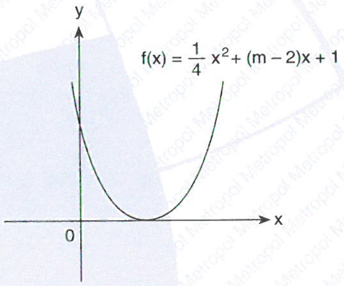
10.



$\Rightarrow$ **k = ?**

A) 5 B) $\frac{20}{3}$ C) $\frac{25}{7}$ D) 9 E) 15

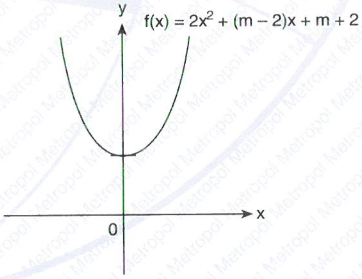
11.



$\Rightarrow \sum m = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

12.



$\Rightarrow$ **m = ?**

A) –2 B) –1 C) 2 D) 3 E) 4

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
C	C	B	D	C	D	E	C	B	B	D	C

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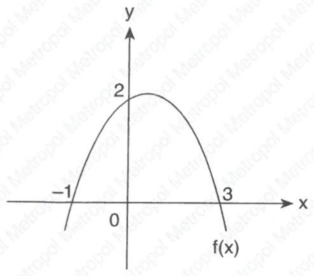
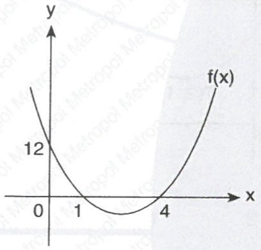
1.



$\Rightarrow$ **f(2) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

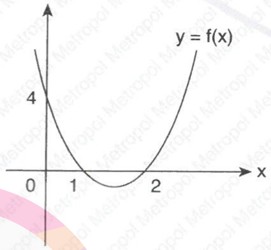
2.



$\Rightarrow$ **f(1) = ?**

A) 0 B) 4 C) 6 D) 8 E) 10

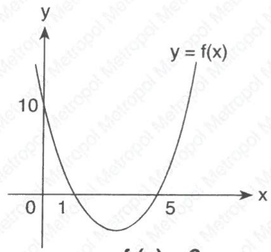
3.



$\Rightarrow$ **f (4) = ?**

A) 6 B) 7 C) 9 D) 10 E) 12

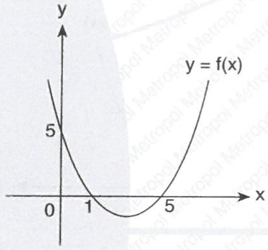
4.



$\Rightarrow$ **f (x) = ?**

A) $x^2 - 6x + 5$ B) $2x^2 - 6x + 5$
C) $2x^2 - 12x + 10$ D) $x^2 + 6x - 5$
E) $2x^2 + 12x - 10$

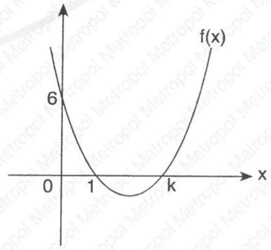
5.



$\Rightarrow$ **min(y) = ?**

A) –5 B) –4 C) –3 D) –2 E) –1

6.



$y = ax^2 + bx + c \Rightarrow$ **a + b = ?**

A) –6 B) –5 C) 0 D) 5 E) 6

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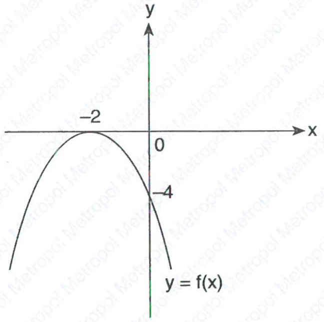
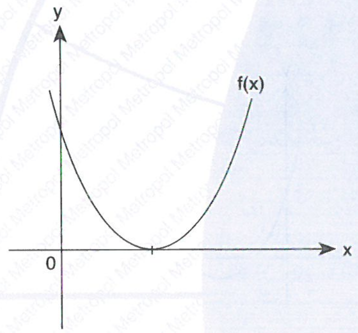
7.



$\Rightarrow$ **f(5) = ?**

A) −28 B) −29 C) −32 D) −49 E) −51

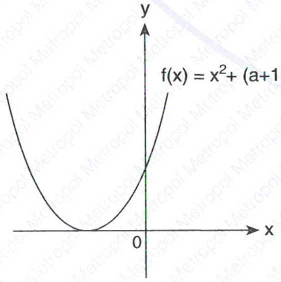
8.



$f(x) = 3x^2 - 6x + a \Rightarrow$ **a = ?**

A) 9 B) 6 C) 3 D) −3 E) 5

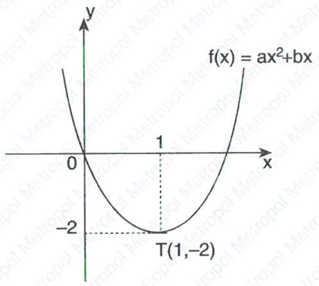
9.



$\Rightarrow$ **a = ?**

A) −1 B) 0 C) 1 D) 2 E) 3

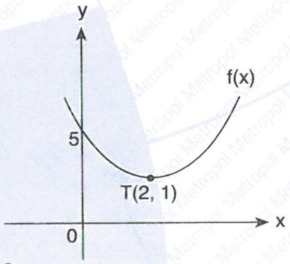
10.



$\Rightarrow$ **f(4) = ?**

A) 12 B) 14 C) 15 D) 16 E) 18

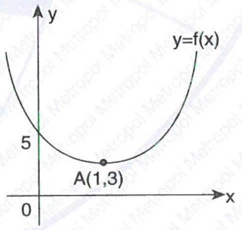
11.



$\Rightarrow$ **f(3) = ?**

A) −1 B) 2 C) −3 D) 5 E) 4

12.



Tepe noktası / The vertex A(1,3),

$y=f(x)=ax^2+bx+c$

$\Rightarrow$ **f(−1) = ?**

A) 9 B) 10 C) 11 D) 12 E) 13

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1	2	3	4	5	6	7	8	9	10	11	12
B	A	E	C	B	A	D	C	C	D	B	C

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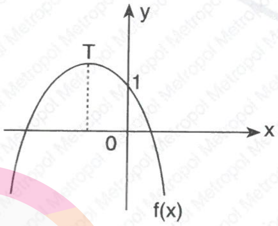
1. $\left.\begin{array}{l} A = x^2 + 4x - 5 \\ B = -x^2 + 2x \end{array}\right\} \Rightarrow \mathbf{max(B) + min(A) = ?}$

A) –8 B) –10 C) –12 D) –14 E) –16

2. $f : R \rightarrow R$, $f(x) = x^2 - 8x + 4(a + 2)$,
$\min(f(x)) = 4 \Rightarrow \mathbf{a = ?}$

A) –4 B) –3 C) 0 D) 3 E) 4

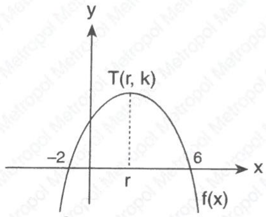
3.



$f(x) = ax^2 + bx + c \Rightarrow \mathbf{c = ?}$

A) 0 B) 1 C) 2 D) 3 E) 4

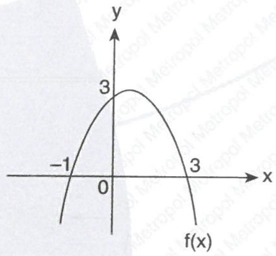
4.



$f(x) = ax^2 + bx + c$, $T(r, k) \Rightarrow \mathbf{r = ?}$

A) 3 B) 2 C) 1 D) 4 E) –1

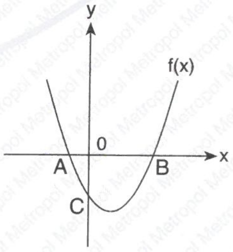
5.



$f : R \rightarrow R$, $f(x) = ax^2 + bx + c \Rightarrow \mathbf{max(f(x)) = ?}$

A) 3 B) 4 C) 6 D) 9 E) 11

6.



$f(x) = x^2 - ax + b$, $C(0, -9)$, $|AB| = 10$ cm $\Rightarrow \mathbf{min(f(x)) = ?}$

A) 10 B) –10 C) 25 D) –5 E) –25

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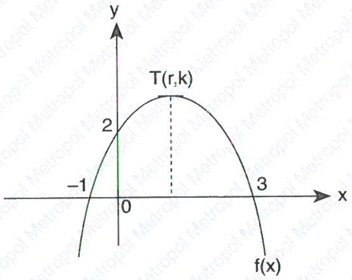
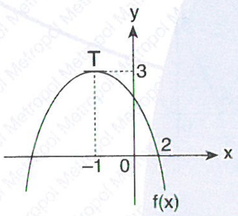
7.



$f(x) = ax^2 + bx + c \Rightarrow$ **$f(-4) = ?$**

A) –19 B) –17 C) –16 D) –14 E) –10

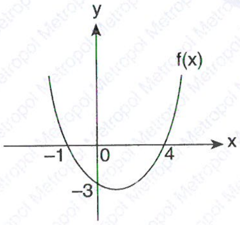
8.



$f(x) = ax^2 + bx + c \Rightarrow$ **$f(5) = ?$**

A) –6 B) –5 C) –7 D) –4 E) –9

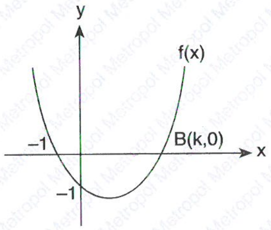
9.



$f(x) = (ax + b).(x + 1) \Rightarrow$ **$a = ?$**

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{3}{4}$ D) $\frac{5}{4}$ E) 1

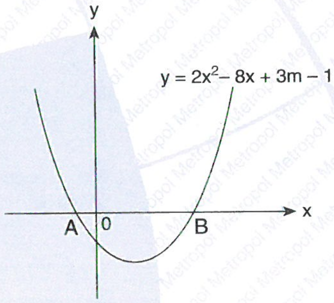
10.



$f(x) = x^2 + ax + b \Rightarrow$ **$k = ?$**

A) 1 B) 3 C) 5 D) 7 E) 9

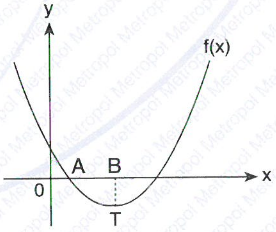
11.



$|AB| = 6$ br (u) $\Rightarrow$ **$m = ?$**

A) –7 B) –6 C) –5 D) –4 E) –3

12.



$f(x) = x^2 - 12x + m + 8$, $|AB| = 2|AO| \Rightarrow$ **$m = ?$**

A) 24 B) 12 C) 6 D) 1 E) –6

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1	2	3	4	5	6	7	8	9	10	11	12
A	D	B	B	B	E	D	E	C	A	E	B

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1. $y = f(x) = x^2 + bx + c,$

$f(1) = f(2) = 0 \Rightarrow$ **b + c = ?**

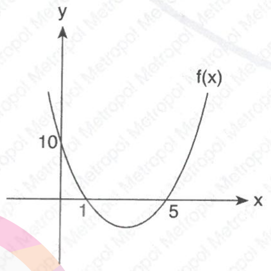
A) 0 B) –1 C) 2 D) 1 E) –2

2. $f(x) = kx^2 + (3k - 1)x + 5,$

$T(1, t) \Rightarrow$ **k = ?**

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

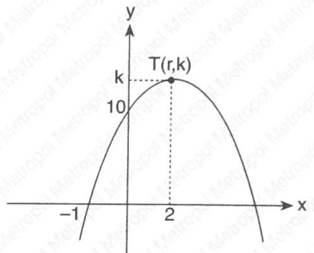
3.



$f(x) = 4 \Rightarrow$ **$\prod x$ = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

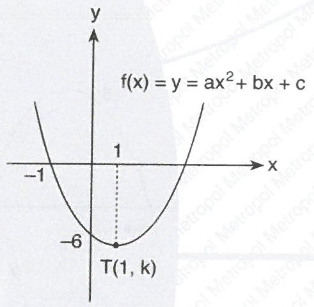
4.



$\Rightarrow$ **r + k = ?**

A) 20 B) 21 C) 22 D) 23 E) 24

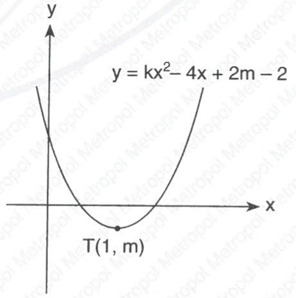
5.



$\Rightarrow$ **k = ?**

A) –2 B) –4 C) –6 D) –8 E) –10

6.



$\Rightarrow$ **m = ?**

A) –2 B) –1 C) 1 D) 2 E) 4

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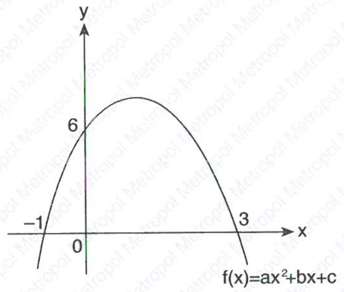
7.

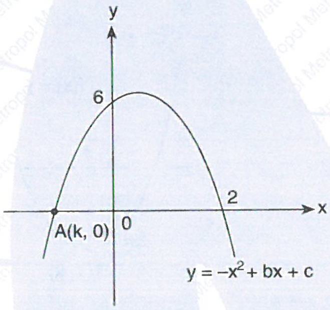


$\Rightarrow f(4)+a+b+c=?$

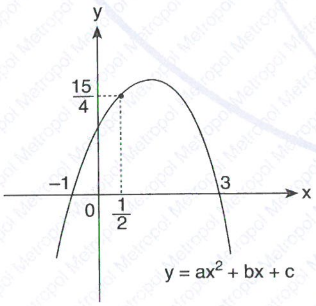
A) –6 B) 2 C) 6 D) 18 E) –2

8. $k = ?$

A) –1
B) –2
C) –3
D) –4
E) –5



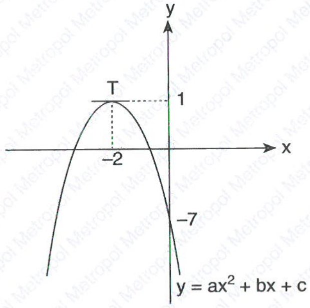
9.



$\Rightarrow a+b+c=?$

A) 1 B) 2 C) 3 D) 4 E) 5

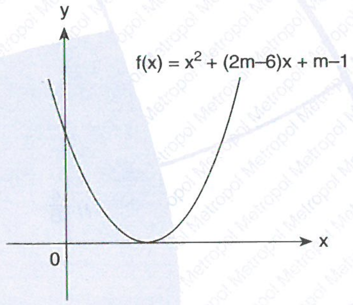
10.



$\Rightarrow f(-a)=?$

A) –27 B) –29 C) –31 D) –33 E) –35

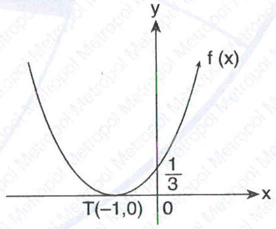
11. $m \neq 5$,



$\Rightarrow m = ?$

A) 1 B) 2 C) 3 D) 4 E) 6

12.



$y = f(x) = ax^2 + bx + c$

$\Rightarrow (fof)(-2) = ?$

A) $\frac{16}{27}$ B) $\frac{5}{9}$ C) $\frac{4}{9}$ D) $\frac{10}{27}$ E) $\frac{16}{9}$

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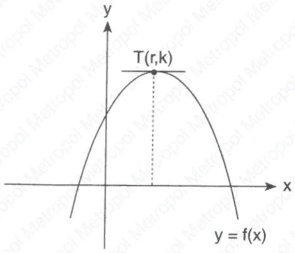
YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
B	A	C	A	D	E	E	C	D	C	B	A

1.



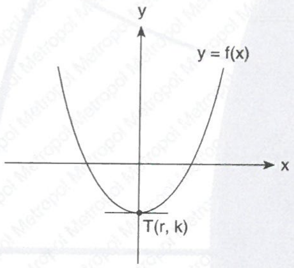
$f(x) = ax^2 + bx + c$ ise aşağıdakilerden hangisi yanlıştır?

If $f(x) = ax^2 + bx + c$, which of the following is not true?

A) $4ac - b^2 < 0$ B) $c > \frac{b^2}{4a}$ C) $-\frac{b}{a} > 0$

D) $a^2 \cdot b \cdot c > 0$ E) $\frac{c^2}{a^3} > 0$

2.



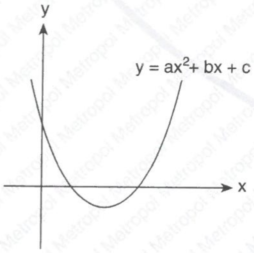
$f(x) = ax^2 + bx + c$ ise aşağıdakilerden hangisi yanlıştır?

If $f(x) = ax^2 + bx + c$, which of the following is not true?

A) $b = 0$ B) $a > 0$ C) $c > 0$

D) $b^2 > 4ac$ E) $a > c$

3.



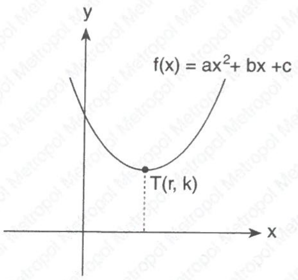
Aşağıdakilerden hangisi doğrudur?

Which of the following is true?

A) $a < 0$ B) $b < 0$ C) $c < 0$

D) $a \cdot c < 0$ E) $a \cdot b > 0$

4.



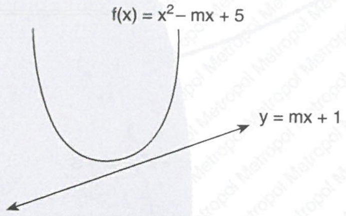
Aşağıdakilerden hangisi yanlıştır?

Which of the following is not true?

A) $c > 0$ B) $\Delta < 0$ C) $a > 0$

D) $b > 0$ E) $x_1 \cdot x_2 > 0$

5.

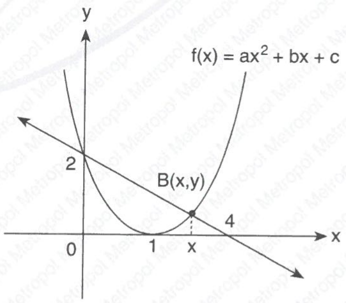


$a < m < b \Rightarrow$ **(a, b) = ?**

A) (–1, 1) B) (–2, 2) C) (–1, 2)

D) (1, 2) E) (–2, –1)

6.



$\Rightarrow$ **x = ?**

A) $\frac{5}{3}$ B) $\frac{5}{2}$ C) $\frac{5}{4}$ D) $\frac{7}{4}$ E) $\frac{9}{4}$

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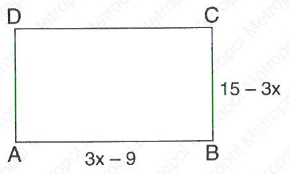
7.



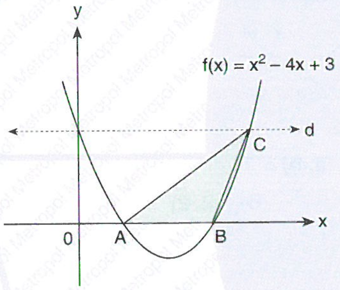
ABCD bir dikdörtgendir.

ABCD is a rectangle.

$\Rightarrow$ **$\max(A(ABCD)) = ?\ br^2(u^2)$**

A) 9 B) $\frac{49}{4}$ C) 16 D) $\frac{81}{4}$ E) 25

8.



d // Ox $\Rightarrow$ **$A(\overset{\triangle}{ABC}) = ?$**

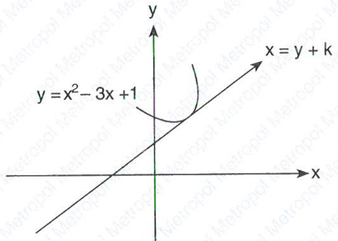
A) 1 B) 2 C) 3 D) 5 E) 6

9. $y = x^2 + (m+2)x - 12$,

$T(2, k)$ $\Rightarrow$ **k = ?**

A) –16 B) –12 C) –8 D) –4 E) 0

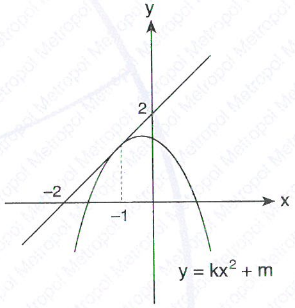
10.



$\Rightarrow$ **k = ?**

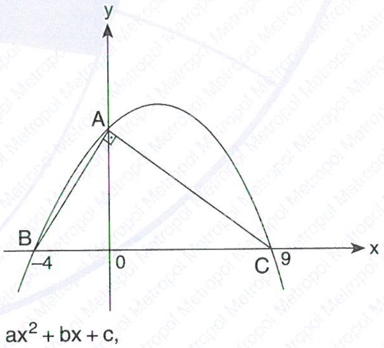
A) 5 B) 4 C) 3 D) 2 E) 1

11. **k + m = ?**



A) 1 B) $\frac{1}{2}$ C) 2 D) $\frac{3}{2}$ E) 3

12.



$y = f(x) = ax^2 + bx + c$,

$[AB] \perp [AC]$ $\Rightarrow$ **$f(2) = ?$**

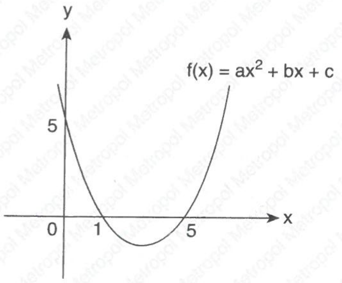
A) 9 B) 8 C) 7 D) 6 E) 5

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
E	C	B	D	B	D	A	C	A	C	A	C

METROPOL YAYINLARI • METROPOL PUBLICATIONS

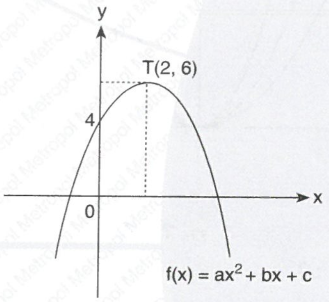
1.



$\Rightarrow$ **3a + b + c = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

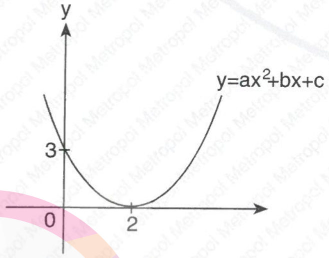
2.



$\Rightarrow$ **f(4) = ?**

A) –6 B) 6 C) 0 D) – 4 E) 4

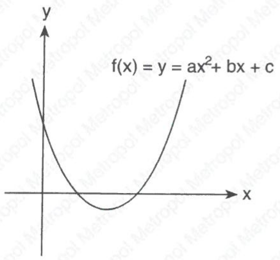
3.



$\Rightarrow$ **a + b + c = ?**

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{3}{4}$ D) $\frac{4}{3}$ E) 2

4.

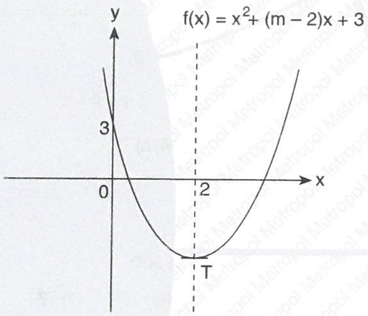


a, b, c nin işareti aşağıdakilerden hangisidir?

Which of the following is the sign of a, b, and c ?

A) +, +, + B) –, –, – C) +, –, – D) +, –, + E) –, +, +

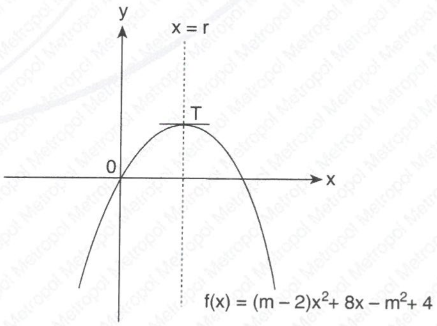
5.



$\Rightarrow$ **m = ?**

A) –2 B) 3 C) –4 D) 5 E) 6

6.



$\Rightarrow$ **r = ?**

A) 10 B) 5 C) 4 D) 2 E) 1

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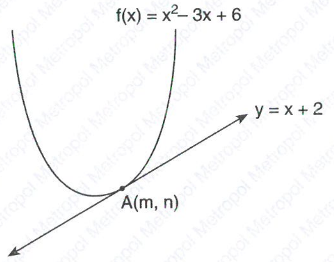
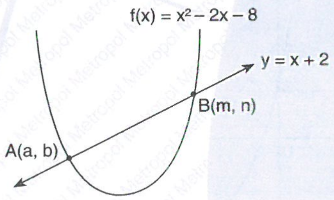
7.



$\Rightarrow$ **m + n = ?**

A) 22 B) 18 C) 6 D) 4 E) 3

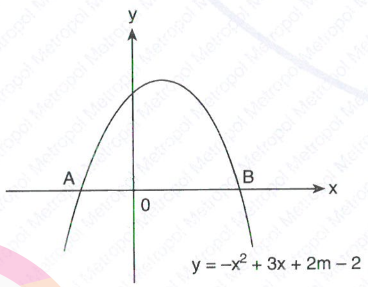
8.



$\Rightarrow$ **b + n = ?**

A) 28 B) 21 C) 14 D) 7 E) 1

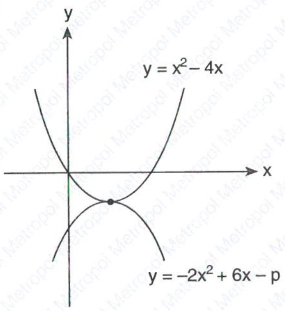
9.



$\frac{|OA|}{|OB|} = \frac{2}{5} \Rightarrow$ **m = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

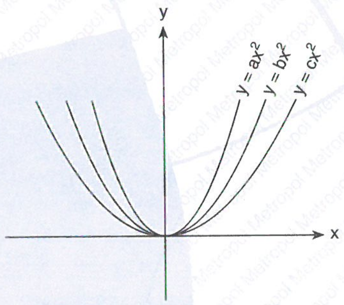
10.



$\Rightarrow$ **p = ?**

A) $\frac{25}{3}$ B) 9 C) 8 D) 7 E) 6

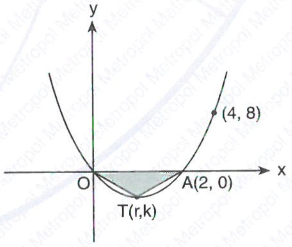
11.



$\Rightarrow$ **? < ? < ?**

A) c < b < a
B) b < a < c
C) a < b < c
D) a < c < b
E) c < a < b

12.



$\Rightarrow$ **A($\widehat{AOT}$) = ? br² (u²)**

A) 1 B) 2 C) 4 D) 8 E) 16

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
D	E	C	D	A	E	C	D	A	A	A	A

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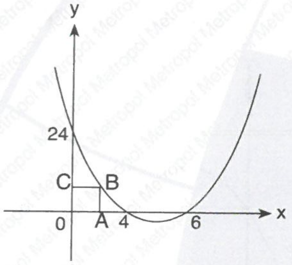
1. $y = x^2 - kx + 10$ **parabolü** $y = 3x + 1$ **doğrusuna teğet ise,** $\sum k = ?$

If $y = x^2 - kx + 10$ is tangent to theline $y = 3x + 1$, $\sum k = ?$

A) – 6 B) – 5 C) – 3 D) – 2 E) –1

2.



$y = f(x) = ax^2 + bx + c$,

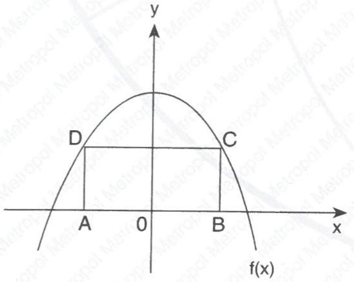
OABC bir karedir.

OABC is a square.

$\Rightarrow$ **A(OABC) = ? cm²**

A) 1 B) 4 C) 8 D) 9 E) 12

3.



$y = f(x) = 25 - x^2$,

ABCD bir dikdörtgendir.

ABCD is a rectangle.

Çevre / The perimeter (ABCD)= 34 br (u)

$\Rightarrow$ **A(ABCD) = ? br² (u²)**

A)144 B) 120 C) 100 D) 72 E) 64

4. $y = x^2 - ax + 5$ **parabolü ile** $y = 2x + 1$ **doğrusu kesişmiyorsa,** $\prod a = ?$

If the graphs of the parabola $y = x^2 - ax + 5$ and the line $y = 2x + 1$ do not intersect, $\prod a = ?$

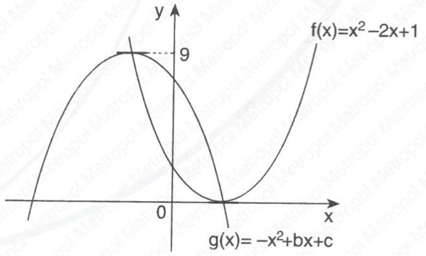
A) 5 B) 0 C) 10 D) 15 E) 20

5. $a \in Z^+$, $y = x^2 + ax + 6$ **parabolü** $y = 4x - 1$ **doğrusu iki farklı noktada kesiştiğine göre, min(a) = ?**

$a \in Z^+$, if the graphs of the parabola $y = x^2 + ax + 6$ and the line $y = 4x - 1$ Intersect at two different points, min (a) = ?

A) 8 B) 9 C) 10 D) 11 E) 12

6.



$\Rightarrow$ **g(0) = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

METROPOL YAYINLARI • METROPOL PUBLICATIONS

YANITLAR / ANSWERS

1	2	3	4	5	6
A	D	D	B	C	C

1. $f: R \to R,\ f(x) = x^2,$

$A = [-1, 4) \Rightarrow$ **$f(A) = ?$**

A) $[1, 16)$ B) $(1, 16)$ C) $[1, 16]$ D) $[0, 16)$ E) $(0, 16)$

[KARABÜK ÜNİVERSİTESİ – YÖS 2018]

2. $f: R \to R,\ f(x) = x^2,$

$B = (0, 25] \Rightarrow$ **$f^{-1}(B) = ?$**

A) $[-5, 5]$ B) $(-5, 5)$ C) $(-5, 5) - \{0\}$ D) $[-5, 5] - \{0\}$ E) $(0, 5)$

[KARABÜK ÜNİVERSİTESİ – YÖS 2018]

3. $f: R \to R,\ f(x) = x^2,$

$C = [-1, 4] \Rightarrow$ **$f^{-1}(C) = ?$**

A) $[0, 2]$ B) $(0, 2)$ C) $[-2, 2]$ D) $[-2, 2] - \{0\}$ E) $(-2, 2] - \{0\}$

[KARABÜK ÜNİVERSİTESİ – YÖS 2018]

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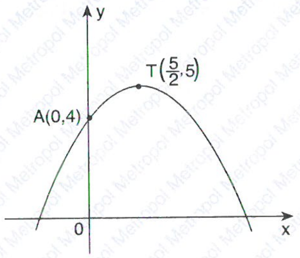
4.

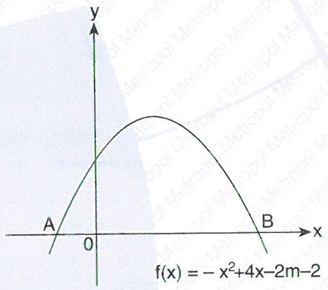


$y = x^2 + bx + c \Rightarrow$ **$b = ?$**

A) $-\frac{4}{25}$ B) $-\frac{4}{5}$ C) $\frac{4}{25}$ D) $\frac{4}{5}$ E) $\frac{5}{4}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2013]

5.

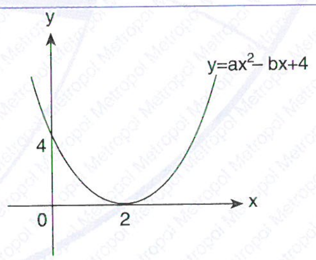


$|OB| = 3 \cdot |OA| \Rightarrow$ **$m = ?$**

A) -4 B) -5 C) -6 D) -7 E) -8

[ANKARA ÜNİVERSİTESİ – YÖS 2013]

6.



$\Rightarrow$ **$a + b = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

[YÖS 2003]

YANITLAR / ANSWERS

1	2	3	4	5	6
D	D	C	D	D	B

BÖLÜM CHAPTER 5

TARİHSEL NOT / HISTORICAL NOTE

EBU'L VEFA EL-BUZCANİ [998 – 940 BC]

İranlı matematikçi ve astronom. Bilim sahasında, matematik bilimini tahsil etti ve özellikle trigonometri üzerinde çalışmalar yaptı. Trigonometrinin altı esas oranı arasındaki trigonometrik ilişkileri ilk defa ortaya koymuştur. Bu oranlar günümüzde aynen kullanılmaktadır.

Iranian mathematician and astronomer. In the field of science, he studied mathematics and made contributions to trigonometry in particular. he revealed the trigonometric relations under the ratios of trigonometry for the first time. These rates are used as is today.

TRİGONOMETRİ I
TRIGONOMETRY I

Bu bölüm 80 alıştırma sorusu, 159 test sorusu, 6 YÖS sorusu içermektedir.

This chapter includes 80 exercise questions, 159 test questions, and 6 YÖS questions.

BÖLÜM / CHAPTER 5

TRİGONOMETRİ I / TRIGONOMETRY I

- Trigonometri I / Trigonometry I .... 111 – 142

TRİGONOMETRİ I
TRIGONOMETRY I

1. $63' = x°y' \Rightarrow x+y=?$

Yanıt / The Answer is 4

2. $3665'' = x°y'z'' \Rightarrow x+y+z=?$

Yanıt / The Answer is 7

3. $m(\widehat{A}) = 25°\ 32'\ 23''$, $m(\widehat{B}) = 13°\ 47'\ 51''$ $\Rightarrow m(\widehat{A}) + m(\widehat{B}) = ?$

Yanıt / The Answer is 39° 20′ 14″

4. $m(\widehat{A}) = 43°\ 35'\ 27''$, $m(\widehat{B}) = 32°\ 44'\ 32''$ $\Rightarrow m(\widehat{A}) - m(\widehat{B}) = ?$

Yanıt / The Answer is 10° 50′ 55″

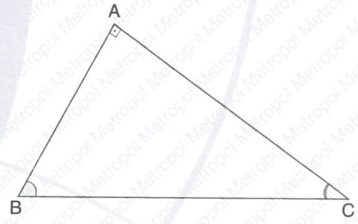
5. $\alpha = 45°\ 24' \Rightarrow \dfrac{\alpha}{3} = ?$

Yanıt / The Answer is 15°8′

6. $\beta = 47°\ 12' \Rightarrow \dfrac{\beta}{4} = ?$

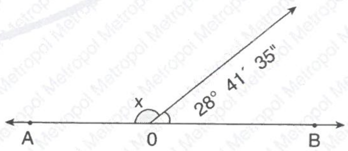
Yanıt / The Answer is 11°48′

7. $m(\widehat{B}) = 50°\ 25'\ 14''$
$\Rightarrow m(\widehat{C}) = ?$



Yanıt / The Answer is 39° 34′ 46″

8.



$\Rightarrow x = ?$

Yanıt / The Answer is 151° 18′ 25″

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9. $\frac{7\pi}{10} = x^\circ \Rightarrow$ **x = ?**

Yanıt / The Answer is 126

10. $\frac{5\pi}{9} = x^\circ \Rightarrow$ **x = ?**

Yanıt / The Answer is 100

11. $120^\circ = x \cdot \pi \Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{2}{3}$

12. $216^\circ = x \cdot \pi \Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{6}{5}$

13. $144^\circ = x \cdot \pi \Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{4}{5}$

14. $\left.\begin{array}{l} m(\widehat{A}) = \frac{3\pi}{8} \\ m(\widehat{B}) = \frac{\pi}{8} \end{array}\right\} \Rightarrow m(\widehat{A}) + m(\widehat{B}) = ?$

Yanıt / The Answer is $\frac{\pi}{2}$

15. $1500^\circ = \alpha + k \cdot 360^\circ \Rightarrow \alpha = ?$

Yanıt / The Answer is 60°

16. $-1600^\circ = \alpha + k \cdot 360^\circ \Rightarrow \alpha = ?$

Yanıt / The Answer is 200°

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17. $79\pi = \alpha + k \cdot 2\pi \Rightarrow \alpha = ?$

Yanıt / The Answer is π

18. $-33\pi = \alpha + k \cdot 2\pi \Rightarrow \alpha = ?$

Yanıt / The Answer is π

19. $\frac{43\pi}{5} = \alpha + k \cdot 2\pi \Rightarrow \alpha = ?$

Yanıt / The Answer is $\frac{3\pi}{5}$

20. $\frac{34\pi}{3} = \alpha + k \cdot 2\pi \Rightarrow \alpha = ?$

Yanıt / The Answer is $\frac{4\pi}{3}$

21. $-\frac{25\pi}{3} = \alpha + k \cdot 2\pi \Rightarrow \alpha = ?$

Yanıt / The Answer is $\frac{5\pi}{3}$

22. $-\frac{32\pi}{5} = \alpha + k \cdot 2\pi \Rightarrow \alpha = ?$

Yanıt / The Answer is $\frac{8\pi}{5}$

23. $\frac{51\pi}{4} = \alpha + k \cdot 2\pi \Rightarrow \alpha = ?$

Yanıt / The Answer is $\frac{3\pi}{4}$

24. $\frac{36\pi}{5} = \alpha + k \cdot 2\pi \Rightarrow \alpha = ?$

Yanıt / The Answer is $\frac{6\pi}{5}$

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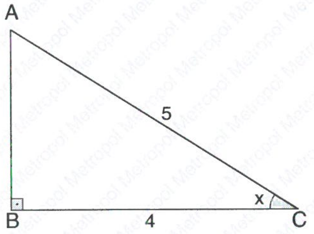
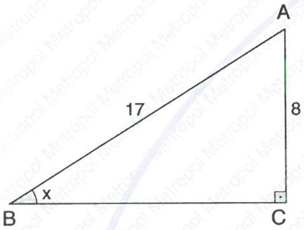
25.



$\Rightarrow$ **tanx=?**

Yanıt / The Answer is $\frac{3}{4}$

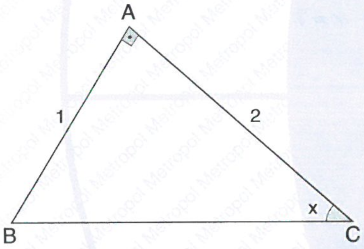
26.



$\Rightarrow$ **cosx=?**

Yanıt / The Answer is $\frac{15}{17}$

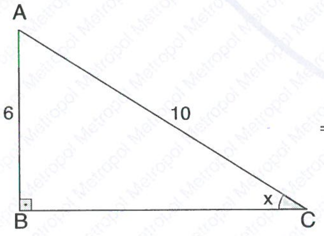
27.



$\Rightarrow$ **sinx+cosx=?**

Yanıt / The Answer is $\frac{3}{\sqrt{5}}$

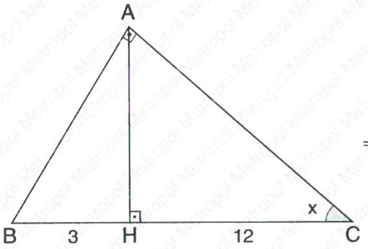
28.



$\Rightarrow$ **cotx+cosx=?**

Yanıt / The Answer is $\frac{32}{15}$

29.



$\Rightarrow$ **tanx=?**

Yanıt / The Answer is $\frac{1}{2}$

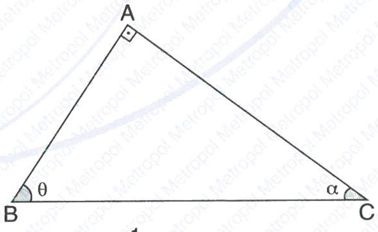
30. $0 < x < 90°$, $\sin x = \frac{3}{5}$ $\Rightarrow$ $\tan x = ?$

Yanıt / The Answer is $\frac{3}{4}$

31. $0 < x < \frac{\pi}{2}$, $\cos x = \frac{12}{13}$ $\Rightarrow$ $\sin x \cdot \tan x = ?$

Yanıt / The Answer is $\frac{25}{156}$

32.



$\sin\alpha = \frac{1}{3}$ $\Rightarrow$ $\sin\theta = ?$

Yanıt / The Answer is $\frac{2\sqrt{2}}{3}$

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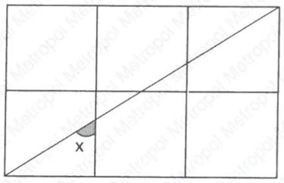
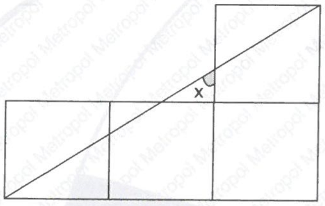
33. **cotx =?**



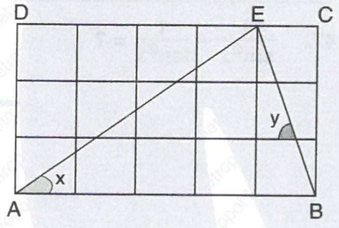
Yanıt / The Answer is $\frac{2}{3}$

34. **cosx =?**



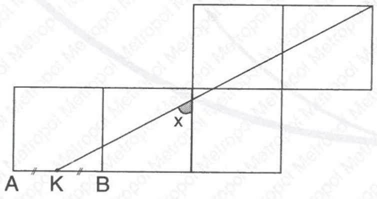
Yanıt / The Answer is $\frac{2}{\sqrt{13}}$

35. $\dfrac{\tan y}{\sin x} = ?$



Yanıt / The Answer is 5

36. $|AK| = |KB| \Rightarrow$ **tanx = ?**

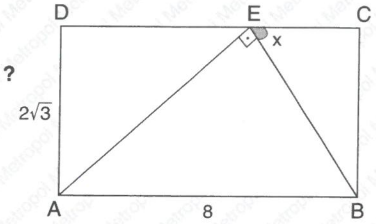


Yanıt / The Answer is $\frac{7}{4}$

37. ABCD bir dikdörtgendir.

ABCD is a rectangle.

$|DE| > |EC| \Rightarrow$ **tanx = ?**



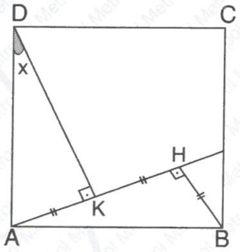
Yanıt / The Answer is $\sqrt{3}$

38. ABCD bir karedir.

ABCD is a square.

$|AK| = |KH| = |BH|$

$\Rightarrow$ **cosx = ?**



Yanıt / The Answer is $\frac{2}{\sqrt{5}}$

39. $5 \cdot \sin x = 3 \cdot \cos x \Rightarrow$ **tanx = ?**

Yanıt / The Answer is $\frac{3}{5}$

40. $0 < x < 90°, \ \dfrac{\cos x + \sin x}{\sin x - \cos x} = \dfrac{3}{2} \Rightarrow$ **cotx = ?**

Yanıt / The Answer is $\frac{1}{5}$

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41. $0 < x < 90°,\ \tan x = \frac{1}{2} \Rightarrow \frac{\sin x + \cos x}{\cos x - \sin x} = ?$

Yanıt / The Answer is 3

42. $0 < x < \frac{\pi}{2},\ \cot x = 3 \Rightarrow \frac{\cos x - \sin x}{\sin x} = ?$

Yanıt / The Answer is 2

43. $\frac{\tan x \cdot \cot x}{2 \cdot \tan 15° \cdot \cot 15°} = ?$

Yanıt / The Answer is $\frac{1}{2}$

44. $1 - \sin^2 x - \cos^2 x = ?$

Yanıt / The Answer is 0

45. $\tan x - \cot x = 3$

$\Rightarrow \tan^2 x + \cot^2 x = ?$

Yanıt / The Answer is 11

46. $\frac{1}{\cos^2 x} - 1 = ?$

Yanıt / The Answer is $\tan^2 x$

47. $\frac{1}{\sin^2 x} - \frac{1}{\tan^2 x} = ?$

Yanıt / The Answer is 1

48. $\frac{3\sin^2 x + 4\cos^2 x - 3}{1 - \sin^2 x} = ?$

Yanıt / The Answer is 1

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49. $\frac{\tan x}{\sin x} \cdot \frac{\cot x}{\cos x} = ?$

Yanıt / The Answer is tanx

50. $\frac{(\sin x + \cos x)^2}{\cos x} - 2 \cdot \sin x = ?$

Yanıt / The Answer is secx

51. $\frac{\sin x}{1 + \cos x} + \frac{1 + \cos x}{\sin x} = ?$

Yanıt / The Answer is $2 \cdot \operatorname{cosec} x$

52. $\sin x + \cos x = \frac{1}{3}$

$\Rightarrow \sin x \cdot \cos x = ?$

Yanıt / The Answer is $-\frac{4}{9}$

53. $\sin^2 50^\circ + \tan 20^\circ \cdot \tan 70^\circ + \sin^2 40^\circ = ?$

Yanıt / The Answer is 2

54. $\frac{\sin 35^\circ + \cos 55^\circ}{3 \cdot \sin 35^\circ} = ?$

Yanıt / The Answer is $\frac{2}{3}$

55. $\frac{\tan 25^\circ + \cot 65^\circ}{4 \cdot \cot 65^\circ} = ?$

Yanıt / The Answer is $\frac{1}{2}$

56. $\frac{\sin 23^\circ}{\cos 67^\circ} + \frac{\tan 20^\circ}{\cot 70^\circ} = ?$

Yanıt / The Answer is 2

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57. $x+y=\frac{\pi}{2}$, $\sin x=\frac{3}{4}$ $\Rightarrow$ $\cos y=?$

Yanıt / The Answer is $\frac{3}{4}$

58. $x+y=\frac{\pi}{2}$, $\sin x=\frac{5}{13}$ $\Rightarrow$ $\cos\left(\frac{\pi}{2}-y\right)=?$

Yanıt / The Answer is $\frac{12}{13}$

59. $x+y=\frac{\pi}{2}$, $\tan x=\frac{2}{3}$ $\Rightarrow$ $\cot y=?$

Yanıt / The Answer is $\frac{2}{3}$

60. $\frac{\sin 45^\circ+\cos 45^\circ}{\cos 60^\circ}=?$

Yanıt / The Answer is $2\sqrt{2}$

61. $\frac{\sin 30^\circ+1}{\cos 60^\circ-1}=?$

Yanıt / The Answer is -3

62. $\frac{\tan 45^\circ+2\cos 60^\circ}{2\sin 30^\circ+\cot 45^\circ}=?$

Yanıt / The Answer is 1

63. $\sqrt{5\cdot\cos 60^\circ+4\cdot\sin 30^\circ}=?$

Yanıt / The Answer is $\frac{3}{\sqrt{2}}$

64. $\sqrt{10-\tan\frac{\pi}{4}}+\sqrt{1+\tan^2\frac{\pi}{3}}=?$

Yanıt / The Answer is 5

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65. $\left(\cos\frac{\pi}{3}\right)^x = 16 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is **– 4**

---

66. $x = \sin 42^\circ$

$y = \sin 55^\circ$

$z = \cos 25^\circ \Rightarrow \mathbf{? < ? < ?}$

Yanıt / The Answer is $\mathbf{x < y < z}$

---

67. $x = \sin 35^\circ$

$y = \cos 65^\circ$

$z = \tan 46^\circ \Rightarrow \mathbf{? < ? < ?}$

Yanıt / The Answer is $\mathbf{y < x < z}$

---

68. $x = \cot 40^\circ$

$y = \cos 50^\circ$

$z = \sin 70^\circ \Rightarrow \mathbf{? < ? < ?}$

Yanıt / The Answer is $\mathbf{y < z < x}$

---

69. $2 \cdot \sin x - 3 \cdot \cos y = A \Rightarrow \mathbf{\min(A) = ?}$

Yanıt / The Answer is **–5**

---

70. $4 \cdot \sin x - 8 \cdot \cos y = A \Rightarrow \mathbf{\max(A) = ?}$

Yanıt / The Answer is **12**

---

71. $6 \cdot \sin x + 8 \cdot \cos x = B \Rightarrow \mathbf{\min(B) = ?}$

Yanıt / The Answer is **–10**

---

72. $9 \cdot \sin x - 12 \cdot \cos x = B \Rightarrow \mathbf{\max(B) = ?}$

Yanıt / The Answer is **15**

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73. $f(x)=\sin 3x-\cos 4x \Rightarrow f\left(\frac{\pi}{2}\right)=?$

Yanıt / The Answer is -2

74. $\cos\left(\frac{3\pi}{2}+x\right)-\sin(\pi-x)=?$

Yanıt / The Answer is 0

75. $\cot\frac{27\pi}{4}\cdot\cos\frac{7\pi}{6}=?$

Yanıt / The Answer is $\frac{\sqrt{3}}{2}$

76. $\sin\frac{25\pi}{6}\cdot\cos\frac{8\pi}{3}=?$

Yanıt / The Answer is $-\frac{1}{4}$

77. $f(x)=\tan\left(\frac{\pi}{2}+x\right) \Rightarrow f\left(\frac{\pi}{4}\right)=?$

Yanıt / The Answer is -1

78. $f(x)=\sin\left(\frac{3\pi}{2}+x\right)+\cos(3\pi-x) \Rightarrow f\left(\frac{\pi}{6}\right)=?$

Yanıt / The Answer is $-\sqrt{3}$

79. $f(x)=\dfrac{\cos\left(\frac{\pi}{2}+x\right)}{\tan(\pi+x)} \Rightarrow f\left(\frac{4\pi}{3}\right)=?$

Yanıt / The Answer is $\frac{1}{2}$

80. $f\left(x+\frac{\pi}{2}\right)=\cos 2x+\sin 3x \Rightarrow f(\pi)=?$

Yanıt / The Answer is -2

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1. $123' = x^\circ\, y' \Rightarrow$ **x · y = ?**

A) 12 B) 6 C) 0 D) 24 E) 48

2. $3692'' = x^\circ\, y'\, z'' \Rightarrow$ **x + y + z = ?**

A) 30 B) 31 C) 32 D) 33 E) 34

3. $12532'' = x^\circ\, y'\, z'' \Rightarrow$ **x + y + z = ?**

A) 75 B) 78 C) 80 D) 83 E) 85

4. $\alpha = 46^\circ\, 18' \Rightarrow \dfrac{\alpha}{3} = ?$

A) $16^\circ\, 24'$ B) $16^\circ\, 26'$ C) $15^\circ\, 24'$ D) $15^\circ\, 26'$ E) $15^\circ\, 27'$

5. $A = 24^\circ\, 16'\, 36''$

$B = 35^\circ\, 48'\, 56''$

$A + B = x^\circ\, y'\, z'' \Rightarrow$ **x + y + z = ?**

A) 92 B) 94 C) 96 D) 97 E) 98

6.
$$\begin{array}{r} 15^\circ\ 21'\ 52'' \\ +\ 48^\circ\ 40'\ 10'' \\ \hline x^\circ\ \ y'\ \ z'' \end{array} \Rightarrow \mathbf{x + y + z = ?}$$

A) 60 B) 62 C) 64 D) 66 E) 68

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7. $k \in Z$,

$675^\circ = x + k \cdot 360^\circ \Rightarrow$ **x = ?**

A) 315° B) 330° C) 335° D) 340° E) 345°

8. $k \in Z$,

$1995^\circ = x + k \cdot 360^\circ \Rightarrow$ **x = ?**

A) 125° B) 145° C) 165° D) 195° E) 205°

9. $k \in Z$,

$1250^\circ = x + k \cdot 360^\circ \Rightarrow$ **x = ?**

A) 150° B) 160° C) 170° D) 180° E) 200°

10. $k \in Z$,

$1917^\circ = x + k \cdot 360^\circ \Rightarrow$ **x = ?**

A) 117° B) 127° C) 137° D) 147° E) 157°

11. $k \in Z$,

$-120^\circ = x + k \cdot 360^\circ \Rightarrow$ **x = ?**

A) 220° B) 230° C) 240° D) 260° E) 280°

12. $k \in Z$,

$-1500^\circ = x + k \cdot 360^\circ \Rightarrow$ **x = ?**

A) 300° B) 240° C) 180° D) 120° E) 60°

13. $k \in Z$,

$-2320^\circ = x + k \cdot 360^\circ \Rightarrow$ **x = ?**

A) 160° B) 180° C) 200° D) 220° E) 240°

14. $k \in Z$,

$-2970^\circ = x + k \cdot 360^\circ \Rightarrow$ **x = ?**

A) 90° B) 120° C) 180° D) 270° E) 300°

15. $k \in Z$,

$\frac{47\pi}{5} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{3\pi}{5}$ B) $\frac{4\pi}{5}$ C) $\frac{6\pi}{5}$ D) $\frac{7\pi}{5}$ E) $\frac{8\pi}{5}$

16. $k \in Z$,

$\frac{62\pi}{3} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{\pi}{3}$ B) $\frac{2\pi}{3}$ C) $\frac{5\pi}{6}$ D) π E) $\frac{4\pi}{3}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	E	D	D	D	E	A	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	A	C	A	C	D	D	B

1. $k \in Z$,
$\frac{31\pi}{2} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{\pi}{4}$ B) $\frac{\pi}{2}$ C) $\frac{2\pi}{3}$ D) π E) $\frac{3\pi}{2}$

2. $k \in Z$,
$\frac{89\pi}{6} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{4\pi}{3}$ B) $\frac{5\pi}{3}$ C) $\frac{5\pi}{6}$ D) $\frac{7\pi}{6}$ E) $\frac{11\pi}{6}$

3. $k \in Z$,
$\frac{137\pi}{3} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{2\pi}{3}$ B) $\frac{4\pi}{3}$ C) $\frac{5\pi}{3}$ D) $\frac{5\pi}{6}$ E) $\frac{7\pi}{6}$

4. $-\frac{7\pi}{12} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{5\pi}{12}$ B) $\frac{3\pi}{4}$ C) $\frac{\pi}{12}$ D) $\frac{7\pi}{12}$ E) $\frac{17\pi}{12}$

5. $k \in Z$,
$-\frac{27\pi}{2} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{\pi}{6}$ B) $\frac{\pi}{5}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{3}$ E) $\frac{\pi}{2}$

6. $-\frac{48\pi}{5} = x + 2k\pi \Rightarrow$ **x = ?**

A) $\frac{4\pi}{5}$ B) $\frac{3\pi}{5}$ C) $\frac{2\pi}{5}$ D) $\frac{\pi}{5}$ E) 0

7. $k \in Z$,
$-\frac{51\pi}{4} = x + k \cdot 360^\circ \Rightarrow$ **x = ?**

A) 45° B) 135° C) 225° D) 245° E) 335°

8. $48^\circ = x \cdot R \Rightarrow$ **x = ?**

A) $\frac{2\pi}{15}$ B) $\frac{\pi}{5}$ C) $\frac{4\pi}{15}$ D) $\frac{2\pi}{5}$ E) $\frac{7\pi}{15}$

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9. $144^\circ = x \cdot R \Rightarrow x = ?$

A) $\frac{\pi}{5}$ B) $\frac{2\pi}{5}$ C) $\frac{3\pi}{5}$ D) $\frac{4\pi}{5}$ E) π

10. $210^\circ = x \cdot R \Rightarrow x = ?$

A) $\frac{\pi}{2}$ B) $\frac{7\pi}{6}$ C) $\frac{2\pi}{3}$ D) $\frac{3\pi}{4}$ E) $\frac{5\pi}{6}$

11. $\frac{5\pi}{12} \cdot R = x^\circ \Rightarrow x = ?$

A) 30 B) 40 C) 55 D) 60 E) 75

12. $\frac{8\pi}{5} \cdot R = x^\circ \Rightarrow x = ?$

A) 144 B) 188 C) 216 D) 256 E) 288

13. $\sin 210^\circ = ?$

A) $\frac{1}{2}$ B) $-\frac{1}{\sqrt{2}}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{2}}{2}$ E) $-\frac{1}{2}$

14. $\cos(-1500^\circ) = ?$

A) $\frac{1}{\sqrt{2}}$ B) $\frac{1}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\sqrt{3}$ E) $\sqrt{2}$

15. $\tan(-1200^\circ) = ?$

A) $\sqrt{3}$ B) $-\sqrt{3}$ C) $\frac{1}{\sqrt{3}}$ D) 1 E) $-\frac{1}{\sqrt{3}}$

16. $\sin 210^\circ - \cos 240^\circ + \tan 225^\circ = ?$

A) $\frac{1}{\sqrt{2}}$ B) $\sqrt{2}$ C) 1 D) 2 E) $2\sqrt{2}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	C	C	E	E	C	C	C
9	10	11	12	13	14	15	16
D	B	E	E	E	B	A	C

1. $k \in Z$,

$1120^\circ = k \cdot 360^\circ + \alpha \Rightarrow \alpha = ?$

A) 20° B) 25° C) 30° D) 35° E) 40°

2. $k \in Z$,

$-1330^\circ = k \cdot 360^\circ + \alpha \Rightarrow \alpha = ?$

A) 80° B) 110° C) 140° D) 170° E) 200°

3. $k \in Z$,

$\frac{77\pi}{12} = k \cdot 2\pi + \alpha \Rightarrow \alpha = ?$

A) $\frac{\pi}{6}$ B) $\frac{\pi}{12}$ C) $\frac{\pi}{2}$ D) $\frac{\pi}{4}$ E) $\frac{5\pi}{12}$

4. $k \in Z$,

$-\frac{109\pi}{7} = k \cdot 2\pi + \alpha \Rightarrow \alpha = ?$

A) $\frac{3\pi}{7}$ B) $\frac{2\pi}{7}$ C) $\frac{\pi}{7}$ D) $\frac{\pi}{14}$ E) $\frac{\pi}{28}$

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5. $\sin 240^\circ = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{1}{2}$ D) $\frac{\sqrt{2}}{2}$ E) $\sqrt{2}$

6. $\cos 930^\circ = ?$

A) -1 B) 1 C) $\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$ E) $-\frac{\sqrt{3}}{2}$

7. $\cos 143^\circ + \sin 53^\circ = ?$

A) -2 B) -1 C) 0 D) 1 E) $\frac{1}{2}$

8. $\sin\left(-\frac{35\pi}{6}\right) + \tan\frac{29\pi}{4} = ?$

A) $\frac{7}{2}$ B) 3 C) $\frac{5}{2}$ D) 2 E) $\frac{3}{2}$

9. a = sin 48°,
b = sin 152°,
c = cos 91°
⇒ **? > ? > ?**

A) c > a > b B) c > b > a
C) b > c > a D) a > b > c
E) a > c > b

10. a = sin48°,
b = cos13°,
c = sin 117°
⇒ **? < ? < ?**

A) a < b < c B) a < c < b
C) b < c < a D) b < a < c
E) c < a < b

11. a = sin120°,
b = tan213°,
c = cot278°
⇒ **a , b , c = ? , ? , ?**

A) +, +, + B) +, +, – C) –, +, –
D) –, –, – E) –, –, +

12. 5·sinx + 12·cosx = A ⇒ **max(A) = ?**

A) 17 B) 16 C) 13 D) 8 E) 5

13. $y \in Z$,
$y = \dfrac{5+3\cdot \cos x}{4} \Rightarrow \sum y = ?$

A) 9 B) 6 C) 3 D) 0 E) –3

14. **tan480° · cos510° = ?**

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) $\frac{5}{2}$ E) $\sqrt{3}$

15. $\dfrac{\sin 230^\circ \cdot \cot(-20^\circ) \cdot \cos 120^\circ}{\cos 400^\circ \cdot \tan 250^\circ} = ?$

A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) $\frac{3}{2}$ D) $-\frac{3}{2}$ E) $\frac{7}{2}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	B	E	A	A	E	C	E
9	10	11	12	13	14	15	
D	B	B	C	C	C	B	

1. $B = 3 \cdot \sin x + 4 \cdot \cos x$

$\Rightarrow$ **max(B) = ?**

A) 3 B) 4 C) 5 D) 7 E) 8

2. $T = 5 \cdot \sin x - 12 \cdot \cos x$

$\Rightarrow$ **min(T) = ?**

A) –13 B) –12 C) –7 D) –5 E) –3

3. $4 - 3a = 2 \cdot \cos 3x \Rightarrow$ **? ≤ a ≤ ?**

A) $\frac{2}{3} \le a \le 1$ B) $-\frac{2}{3} \le a \le 2$

C) $-2 \le a \le \frac{2}{3}$ D) $\frac{2}{3} \le a \le 2$

E) $-2 \le a \le -\frac{2}{3}$

4. $A = 5 \cdot \sin x - 7 \cdot \cos y$

$\Rightarrow$ **max(A) + min(A) = ?**

A) –2 B) 0 C) 2 D) 5 E) 7

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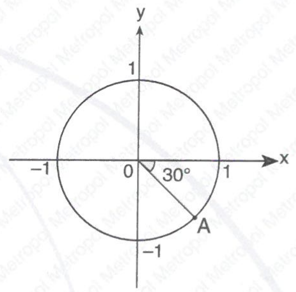
5. $3 \cdot \sin 5x + 5 \cdot \cos 3y = A$,

$m \le A \le n \Rightarrow$ **n – m = ?**

A) –8 B) 0 C) 8 D) 16 E) 18

6.

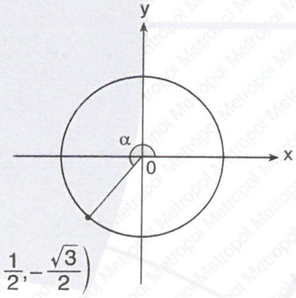


$\Rightarrow$ **A = ?**

A) $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ B) $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ C) $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

D) $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ E) $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

7.



$P\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

$\Rightarrow$ **α = ?**

A) $\frac{4\pi}{3}$ B) $\frac{5\pi}{3}$ C) $\frac{3\pi}{2}$

D) $\frac{7\pi}{4}$ E) $\frac{7\pi}{5}$

8. $\left.\begin{array}{l} a = \sin 72^\circ \\ b = \cos 72^\circ \\ c = \tan 72^\circ \end{array}\right\} \Rightarrow$ **? < ? < ?**

A) b < a < c B) c < b < a

C) b < c < a D) c < a < b

E) a < b < c

9. a = sin68°, b = cos385°, c = cos13°

⇒ **? < ? < ?**

A) b < a < c B) a < b < c
C) b < c < a D) c < b < a
E) c < a < b

10. $\left.\begin{array}{l} a = \tan 50^\circ \\ b = \sin 80^\circ \\ c = \cos 70^\circ \\ d = \cot 70^\circ \end{array}\right\} \Rightarrow$ **? > ? > ? > ?**

A) a > c > b > d B) a > b > d > c
C) a > b > c > d D) b > a > c > d
E) b > a > d > c

11. $\dfrac{3\cdot\cos^2 30^\circ + \sin^2 30^\circ - 2}{2\cos 30^\circ} = ?$

A) $2\sqrt{3}$ B) $\sqrt{3}$ C) 1 D) $\frac{1}{2}$ E) $\frac{1}{2\sqrt{3}}$

12. **(tan25° · tan65°) + (sin²58° + sin²32°) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

13. **cot²x + 1 = ?**

A) 1 B) sin²x C) cos²x
D) sec²x E) cosec²x

14. $\dfrac{\sin 40^\circ\cdot\cos 40^\circ}{\sin 50^\circ\cdot\cos 50^\circ} + \cot 35^\circ\cdot\cot 55^\circ = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

15. $\dfrac{1+\cot x}{1+\tan x} = ?$

A) tanx B) cotx C) sinx
D) cosx E) 1

16. $\dfrac{1}{1+\tan^2 30^\circ} + \dfrac{1}{1+\cot^2 30^\circ} = ?$

A) $\sqrt{3}$ B) 1 C) $\frac{1}{2}$ D) $\frac{1}{\sqrt{3}}$ E) $\frac{1}{\sqrt{2}}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	A	D	B	D	E	A	A
9	10	11	12	13	14	15	16
A	B	E	B	E	E	B	B

1. $\sin x + \cot x \cdot \cos x - \operatorname{cosec} x = ?$

A) 1 B) 0 C) cosx D) 2secx E) 2tanx

2. $\dfrac{1}{1-\tan x} + \dfrac{1}{1-\cot x} = ?$

A) 0 B) $\frac{1}{2}$ C) 1 D) tanx E) cotx

3. $\dfrac{\sin^2 x}{1+\cos x} - 1 = ?$

A) –sinx B) –cosx C) secx D) cosecx E) 1

4. $\sin x \cdot \operatorname{cosec} x - \dfrac{\sin^2 x}{1+\cos x} = ?$

A) secx B) cosecx C) tanx D) sinx E) cosx

5. $\dfrac{\sec x + \sin x}{\cos x + \operatorname{cosec} x} = ?$

A) sinx B) cosx C) tanx D) cotx E) secx

6. $\dfrac{\sin^2 x}{1-\cos x} + \dfrac{\sin^2 x}{1+\cos x} = ?$

A) 1 B) 2 C) sinx D) cosx E) tanx

7. $\dfrac{4 \cdot \cos 32^\circ + 2 \cdot \sin 58^\circ}{3 \cdot \sin 58^\circ} = ?$

A) $\frac{2}{3}$ B) $2\sin 58^\circ$ C) $2\cos 58^\circ$ D) 2 E) $\frac{2}{3} \cdot \cos 32^\circ$

8. $\dfrac{5 \cdot \sin x - 4 \cdot \cos x}{5 \cdot \sin x + 4 \cdot \cos x} = \dfrac{1}{3} \Rightarrow \tan x = ?$

A) $\frac{4}{5}$ B) 1 C) $\frac{7}{5}$ D) $\frac{8}{5}$ E) 2

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9. $\dfrac{3\cdot\sin x - 2\cdot\cos x}{\sin x + \cos x} = 2 \Rightarrow$ **tanx = ?**

A) $\frac{1}{4}$ B) 1 C) 2 D) 4 E) $\frac{9}{2}$

10. $\tan x - \cot x = 3$

$\Rightarrow$ **$\tan^3 x - \cot^3 x = ?$**

A) 12 B) 18 C) 24 D) 27 E) 36

11. $\tan x + \cot x = 2$

$\Rightarrow$ **$\tan^3 x + \cot^3 x = ?$**

A) 14 B) 10 C) 8 D) 6 E) 2

12. $\dfrac{\cos x}{\sin x + 1} + \dfrac{1 + \sin x}{\cos x} = ?$

A) secx B) 2·secx C) cosecx D) 2cosecx E) –secx

13. $1 - \cot^2 x + \dfrac{1}{\sin^2 x} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

14. $\dfrac{\cos 150^\circ \cdot \sin 120^\circ}{\sin(-150^\circ)} = ?$

A) $-\frac{1}{2}$ B) $-\frac{2}{3}$ C) $\frac{1}{2}$ D) $\frac{2}{3}$ E) $\frac{3}{2}$

15. $\dfrac{\sin 150^\circ + \cos 120^\circ}{\tan 135^\circ + \cos 135^\circ} = ?$

A) $-\frac{1}{2}$ B) 0 C) $\frac{1}{2}$ D) $\sqrt{\frac{2}{3}}$ E) $\sqrt{\frac{3}{2}}$

16. $\sin 20^\circ = m$

$\Rightarrow$ **$\sin 920^\circ + \cos(-4030^\circ) = ?$**

A) –1 B) 1 C) 0 D) 2 E) 4

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	C	B	E	C	B	D	D
9	10	11	12	13	14	15	16
D	E	E	B	E	E	B	C

1. $\sin 120^\circ = ?$

A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) $\sqrt{3}$ D) $\frac{\sqrt{3}}{2}$ E) $-\frac{\sqrt{3}}{2}$

2. $\frac{\cos 40^\circ}{\sin 140^\circ} \cdot \tan 320^\circ \cdot \sin 210^\circ = ?$

A) -1 B) $\frac{1}{2}$ C) 1 D) $\frac{\sqrt{3}}{2}$ E) $-\frac{\sqrt{3}}{2}$

3. $f(x) = \sin 2x + 1 \Rightarrow f\left(\frac{5\pi}{12}\right) = ?$

A) $\frac{1}{2}$ B) 2 C) $\frac{3}{2}$ D) 1 E) $\frac{5}{2}$

4. $\cos\left(\alpha - \frac{3\pi}{2}\right) \cdot \tan\left(\frac{\pi}{2} - \alpha\right) = ?$

A) $\sin\alpha$ B) $\cos\alpha$ C) $-\tan\alpha$ D) $-\sin\alpha$ E) $-\cos\alpha$

5. $\sin\left(x + \frac{\pi}{2}\right) + \cos(x - 5\pi) = ?$

A) $\frac{3}{2}$ B) $\frac{1}{2}$ C) 0 D) 1 E) -1

6. $\frac{\cos(-\alpha)}{\cot(\pi + \alpha)} - \frac{\sin(2\pi + \alpha)}{\cos(\alpha - \pi)} = ?$

A) $\cos\alpha - \sin\alpha$ B) $\cos\alpha + \sin\alpha$ C) $\tan\alpha + \cot\alpha$ D) $\sin\alpha + \tan\alpha$ E) $-\tan\alpha - \cot\alpha$

7. $\pi < x < \frac{3\pi}{2}$,

$3 \cdot \sin x = 3 \cdot \cos x - \cos\left(\frac{\pi}{2} - x\right) \Rightarrow \cos x = ?$

A) $-\frac{1}{5}$ B) $-\frac{2}{5}$ C) $-\frac{3}{5}$ D) $-\frac{4}{5}$ E) -1

8. $\sin\left(\frac{5\pi}{2} - x\right) + \cos(3\pi - x) - \cot\left(\frac{11\pi}{2} + x\right) = ?$

A) $\sin x$ B) $\cos x$ C) $\tan x$ D) $\cot x$ E) $\sec x$

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9. $f(x) = 2\cdot\cos(\pi - x) + \sin\left(\frac{\pi}{2} - x\right) + 1 \Rightarrow \mathbf{f\left(\frac{\pi}{3}\right) = ?}$

A) 2 B) 4 C) $\frac{1}{4}$ D) $\frac{3}{2}$ E) $\frac{1}{2}$

10. $0 < \alpha < \frac{\pi}{2},\ \sin\alpha = \frac{3}{5} \Rightarrow \mathbf{\frac{\cos\alpha + \tan\alpha}{1-\cos\alpha} = ?}$

A) $\frac{3}{4}$ B) $\frac{7}{4}$ C) $\frac{11}{4}$ D) $\frac{17}{4}$ E) $\frac{31}{4}$

11. $x \in \left(\frac{3\pi}{2}, 2\pi\right)$ ve (and) $\tan x = -\frac{2}{3}$

$\Rightarrow \mathbf{\sin x \cdot \cos x = ?}$

A) $-\frac{2}{13}$ B) $-\frac{6}{13}$ C) $-\frac{12}{13}$ D) $-\frac{18}{13}$ E) $-\frac{21}{13}$

12. $\pi < x < \frac{3\pi}{2},\ \tan x = 3 \Rightarrow \mathbf{\sin x = ?}$

A) $\sqrt{10}$ B) $-\sqrt{10}$ C) $\frac{3\sqrt{10}}{10}$

D) $-\frac{3\sqrt{10}}{10}$ E) $9\sqrt{10}$

13. $\frac{3\pi}{2} < x < 2\pi,\ \cos x = \frac{3}{5} \Rightarrow \mathbf{\tan x = ?}$

A) $-\frac{4}{3}$ B) $-\frac{5}{3}$ C) -2 D) $-\frac{7}{3}$ E) $-\frac{8}{3}$

14. $0 < x < \frac{\pi}{2},\ \sin x = a \Rightarrow \mathbf{\tan x = ?}$

A) $\sqrt{1-a^2}$ B) $\frac{a}{\sqrt{1-a^2}}$

C) $-\frac{a}{\sqrt{1-a^2}}$ D) $-\sqrt{1-a^2}$

E) $a\cdot\sqrt{1-a^2}$

15. $\frac{\pi}{2} < x < \pi$ ve (and) $\frac{\cos^2 x}{1+\sin x} = \frac{1}{5} \Rightarrow \mathbf{\tan x = ?}$

A) $\frac{\sqrt{3}}{3}$ B) $\sqrt{3}$ C) $-\sqrt{3}$ D) $-\frac{1}{3}$ E) $-\frac{4}{3}$

16. $\sin x + \operatorname{cosec} x = \frac{7}{4} \Rightarrow \mathbf{1-\cos^2 x + \operatorname{cosec}^2 x = ?}$

A) $\frac{1}{16}$ B) $\frac{9}{16}$ C) $\frac{17}{16}$ D) $\frac{25}{16}$ E) $\frac{33}{16}$

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1	2	3	4	5	6	7	8
D	B	C	E	C	D	D	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
E	E	B	D	A	B	E	C

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1. $0 < x < \frac{\pi}{2}$, $\sin x = \frac{1}{2} \Rightarrow$ **tanx + cotx = ?**

A) $\frac{4\sqrt{3}}{3}$ B) $\frac{\sqrt{3}}{3}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{4}{3}$

2. $0 < x < \frac{\pi}{2}$, $\sin x = \frac{2}{3} \Rightarrow$ $\mathbf{\frac{\cos x}{\tan x} = ?}$

A) $\frac{2}{5}$ B) $\frac{5}{3}$ C) $\frac{2\sqrt{5}}{5}$ D) $\frac{\sqrt{5}}{3}$ E) $\frac{5}{6}$

3. $0 < x < \frac{\pi}{2}$, $\tan x = \frac{2}{5} \Rightarrow$ **sinx = ?**

A) $\frac{1}{\sqrt{29}}$ B) $\frac{2}{\sqrt{29}}$ C) $\frac{3}{\sqrt{29}}$ D) $\frac{4}{\sqrt{29}}$ E) $\frac{5}{\sqrt{29}}$

4. $\pi < x < \frac{3\pi}{2}$, $\tan x = \frac{4}{3} \Rightarrow$ **sinx + cosx = ?**

A) -1 B) $-\frac{6}{5}$ C) $-\frac{7}{5}$ D) $-\frac{8}{5}$ E) $-\frac{9}{5}$

5. $\pi < x < \frac{3\pi}{2}$,

$\sin x = -\frac{3}{5} \Rightarrow$ $\mathbf{\frac{\sec x}{\operatorname{cosec} x} + \cot x = ?}$

A) $-\frac{25}{12}$ B) $-\frac{7}{12}$ C) $\frac{1}{2}$ D) $\frac{7}{12}$ E) $\frac{25}{12}$

6. $\sec x = \frac{\sqrt{5}}{2} \Rightarrow$ $\mathbf{\frac{\operatorname{cosec} x}{\cos x + \sin x} = ?}$

A) $\frac{3}{5}$ B) $\frac{4}{5}$ C) $\frac{4}{3}$ D) $\frac{5}{3}$ E) 1

7. $\pi < x < \frac{3\pi}{2}$, $\cos x = -\frac{12}{13} \Rightarrow$ $\mathbf{\frac{\tan x + \sec x}{\operatorname{cosec} x - \cot x} = ?}$

A) $-\frac{5}{13}$ B) $-\frac{2}{13}$ C) $-\frac{2}{15}$ D) $\frac{2}{15}$ E) $\frac{5}{13}$

8. $\frac{\pi}{2} < x < \pi$, $\frac{2 \cdot \sin x + \cos x}{\sin x - \cos x} = \frac{2}{3} \Rightarrow$ **tanx = ?**

A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) $-\frac{3}{4}$ D) $-\frac{5}{4}$ E) $-\frac{5}{2}$

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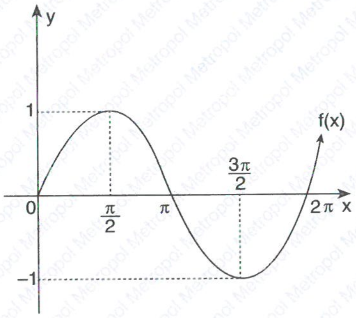
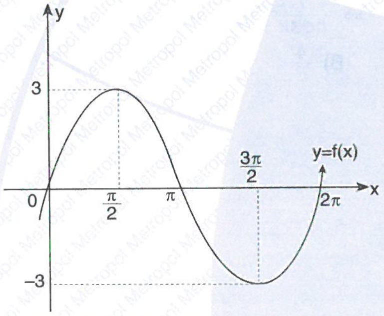
9.



$\Rightarrow$ **f(x) = ?**

A) cosx B) tanx C) sinx D) secx E) cotx

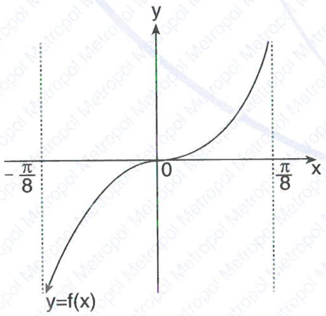
10.



$\Rightarrow$ **y = f(x) = ?**

A) $y = 3 \cdot \sin 2x$ B) $y = 3 \cdot \cos 2x$ C) $y = 3 \cdot \cos x$ D) $y = 3 \cdot \sin x$ E) $y = \sin 3x$

11.



$\Rightarrow$ **y = f(x) = ?**

A) $y = \tan 4x$ B) $y = \cot 4x$ C) $y = 4 \cdot \tan x$ D) $y = 4 \cdot \cot x$ E) $y = 2 \cdot \tan 2x$

12. $\frac{\pi}{2} < x < \pi$,

$9 \cdot \sin^2 x = 16 \cdot \cos^2 x$

$\Rightarrow$ **$\sin x + \tan x = ?$**

A) $-\frac{8}{15}$ B) $-\frac{2}{5}$ C) $\frac{2}{5}$ D) $\frac{8}{15}$ E) $\frac{2}{3}$

13. **$\tan 27^\circ \cdot \tan 63^\circ \cdot \cos 150^\circ \cdot \tan 210^\circ = ?$**

A) $-\frac{1}{2}$ B) $-\frac{2}{3}$ C) $\frac{1}{2}$ D) $-\frac{\sqrt{2}}{3}$ E) $\frac{\sqrt{3}}{2}$

14. **$\tan 2^\circ \cdot \tan 4^\circ \cdot \tan 6^\circ \cdot \ldots \cdot \tan 88^\circ = ?$**

A) –2 B) –1 C) 0 D) 1 E) tan4°

15. $\dfrac{\sin^3 x + \cos^3 x}{1 - \sin x \cdot \cos x} = ?$

A) 1 B) $\sin x \cdot \cos x$ C) $\cos x - \sin x$ D) $\sin x + \cos x$ E) $\sin x - \cos x$

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1	2	3	4	5	6	7	8
A	E	B	C	E	D	D	D
9	10	11	12	13	14	15	
C	D	A	A	A	D	D	

1. $\cot 1^\circ \cdot \cot 2^\circ \cdot \cot 3^\circ \cdot \ldots \cdot \cot 89^\circ = ?$

A) 0 B) 1 C) $\frac{1}{2}$ D) –1 E) $-\frac{1}{2}$

2. $\left(1-\frac{1}{\cos^2 x}\right)\cdot\left(1-\frac{1}{\sin^2 x}\right) = ?$

A) –1 B) –2 C) 0 D) 2 E) 1

3. $\tan x + \cot x = ?$

A) $\sec x \cdot \tan x$ B) $-\sec x \cdot \tan x$
C) $\sec x \cdot \operatorname{cosec} x$ D) $-x \cdot \sec x$
E) $\sin x \cdot \cos x$

4. $\frac{\sec x \cdot \cot x}{1+\cot^2 x} = ?$

A) $\sin x$ B) $\cos x$ C) $\tan x$ D) $\cot x$ E) $\sec x$

5. $\frac{1-\sin\alpha}{\cos\alpha} + \frac{\cos\alpha}{1-\sin\alpha} = ?$

A) $2\cdot\sin\alpha$ B) $2\cdot\tan\alpha$ C) $2\cdot\cot\alpha$
D) $2\cdot\sec\alpha$ E) $2\cdot\sin 2\alpha$

6. $\frac{\sin^2 x + \cos^2 x}{2+\sin\left(\frac{\pi}{2}+x\right)+\cos(\pi - x)} = ?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

7. $\frac{2-2\cdot\cos^2 x+3\cdot\sin^2 x}{-5+5\cdot\cos^2 x} = ?$

A) –5 B) –4 C) –3 D) –2 E) –1

8. $(\sec x+1)\cdot(\cot x-\operatorname{cosec} x) = ?$

A) $-\sin x$ B) $-\cos x$ C) $-\tan x$
D) $-\cot x$ E) $-\sec x$

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9. $\dfrac{\sin\theta}{1+\cos\theta}+\dfrac{1+\cos\theta}{\sin\theta}=?$

A) $2\cdot\sec\theta$
B) $2\cdot\operatorname{cosec}\theta$
C) $2\cdot\tan\theta$
D) $-2\cdot\operatorname{cosec}\theta$
E) $-2\cdot\sec\theta$

10. $\dfrac{1}{\cot x}\cdot\left(\operatorname{cosec}x-\dfrac{\sin x}{1+\cos x}\right)=?$

A) 4 B) 2 C) 1 D) 0 E) $\frac{1}{4}$

11. $\dfrac{\sin x}{1-\cot x}-\dfrac{\cos x}{1-\tan x}=?$

A) $\sin x+\cos x$
B) $\tan x+\cot x$
C) $(\sin x+\cos x)^{-1}$
D) $(\sin x-\cos x)^{-1}$
E) $2\cdot(\sin x+\cos x)^{-1}$

12. $\dfrac{1}{\cot x}\cdot\left(\operatorname{cosec}x-\dfrac{\sin x}{1+\cos x}\right)=?$

A) 4 B) 2 C) 1 D) 0 E) $\frac{1}{4}$

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12. $\left(\dfrac{\cos^2x}{1-\sin x}\right):\left(1+\dfrac{1}{\sin x}\right)=?$

A) $\sin x$ B) $\sin 2x$ C) $\cos x$ D) $\cos 2x$ E) $\tan 2x$

13. $0<x<\pi,\ \dfrac{\sin x+\cos x}{\tan^2x+1}=0\ \Rightarrow\ x=?$

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{2\pi}{3}$ D) $\frac{3\pi}{4}$ E) $\frac{3\pi}{8}$

14. $\dfrac{\sin x}{\sin x-\cos x}-\dfrac{\cos x}{\sin x+\cos x}=A\ \Rightarrow\ A\cdot(\sin^2x-\cos^2x)=?$

A) 1
B) $\sin 2x$
C) $\cos 2x$
D) $\sin 2x+\cos 2x$
E) $\tan 2x$

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1	2	3	4	5	6	7
B	E	C	A	D	A	E
8	**9**	**10**	**11**	**12**	**13**	**14**
C	B	C	D	C	D	A

1. $\sin(x+\pi)-\cos(x-\pi)+\cos\left(x-\frac{3\pi}{2}\right)+\sin\left(x-\frac{\pi}{2}\right)=?$

A) 0 B) $-2\cdot\sin x$ C) $-2\cdot\cos x$ D) $\cos x-\sin x$ E) $\sin x-\cos x$

2. $0<x<\frac{\pi}{2},\ \cos x=\frac{1}{3}\ \Rightarrow\ \cos\left(\frac{\pi}{2}+x\right)=?$

A) $\frac{\sqrt{2}}{2}$ B) $\frac{2\sqrt{2}}{3}$ C) $-\frac{2\sqrt{2}}{3}$ D) $\frac{\sqrt{2}}{3}$ E) $-\frac{\sqrt{2}}{3}$

3. $\tan x=3\ \Rightarrow\ \dfrac{\tan\left(\frac{\pi}{2}+x\right)-\cot\left(\frac{3\pi}{2}-x\right)}{\tan\left(x-\frac{3\pi}{2}\right)\cdot\tan(\pi+x)}=?$

A) $-\frac{10}{3}$ B) $-\frac{8}{3}$ C) -1 D) $\frac{8}{3}$ E) $\frac{10}{3}$

4. $\sin 20^\circ=x\ \Rightarrow$

$\dfrac{\sin 250^\circ-\sin 70^\circ}{\cot 200^\circ\cdot\sin 160^\circ}\cdot\cos 70^\circ=?$

A) $-2x$ B) $-x$ C) x^2 D) $2x$ E) $\frac{2}{x}$

5. $\tan 15^\circ=a\ \Rightarrow\ \dfrac{\tan 195^\circ+\tan 165^\circ}{\cot 165^\circ}=?$

A) a B) a^2 C) 0 D) $-2a^2$ E) $-2a$

6. $\cot 75^\circ=a\ \Rightarrow\ \cot 105^\circ+\cot 225^\circ=?$

A) $-a$ B) $-\frac{a}{1+a}$ C) a D) $1-a$ E) $1+a$

7. $\sin 15^\circ=a\ \Rightarrow\ \dfrac{\sin 195^\circ+2\cdot\sin 345^\circ}{\cos 75^\circ+\cos 285^\circ}=?$

A) $\frac{3}{2}$ B) $-\frac{3}{2}$ C) 2a D) a E) $-a$

8. $\tan 10^\circ=x\ \Rightarrow\ \dfrac{\tan 225^\circ+\tan 190^\circ}{\cot 170^\circ+\tan 135^\circ}=?$

A) 1 B) x C) $-x$ D) 2x E) $-2x$

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9. $f(x) = \cos 4x + 3 + 3\cdot\tan 2x \Rightarrow f\left(-\frac{\pi}{8}\right) = ?$

A) –3 B) –1 C) 0 D) 1 E) 3

10. $f(x) = \begin{cases} \tan x + \cot x, & x < \frac{\pi}{4} \\ \sin x \cdot \cos x, & \frac{\pi}{4} \leq x \end{cases}$

$\Rightarrow f\left(\frac{\pi}{6}\right) - f\left(\frac{\pi}{3}\right) = ?$

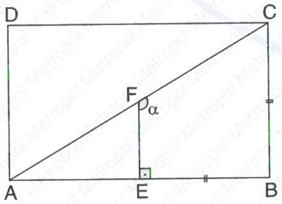
A) $\frac{\sqrt{3}}{12}$ B) $\frac{5\sqrt{3}}{12}$ C) $\frac{7\sqrt{3}}{12}$ D) $\frac{13\sqrt{3}}{12}$ E) $\frac{19\sqrt{3}}{12}$

11. $0 < \sin x < \sin y$,

$\cos x < \cos y \Rightarrow ? < ? < ?$

A) $0 < x < y < 90°$ B) $0 < y < x < 90°$ C) $90° < x < y < 180°$ D) $90° < y < x < 180°$ E) $0 < x < 90° < y < 180°$

12.



ABCD bir dikdörtgendir. ABCD is a rectangle.

$|EB| = |BC|$, $|AF| = |FC| \Rightarrow \tan\alpha = ?$

A) –2 B) –1 C) $\frac{1}{2}$ D) 1 E) 2

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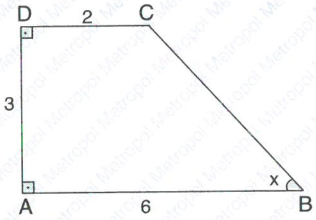
13.



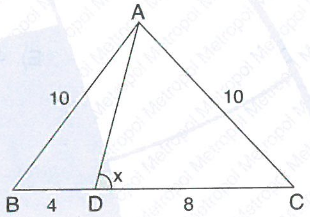
ABCD bir yamuktur.

ABCD is a trapezoid.

$\Rightarrow \cos x = ?$

A) $\frac{3}{4}$ B) $\frac{4}{3}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) $\frac{1}{2}$

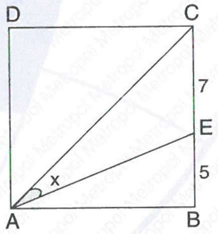
14.



$\Rightarrow \tan x = ?$

A) 4 B) 3 C) $\frac{4}{3}$ D) $\frac{1}{3}$ E) $\frac{1}{4}$

15.



ABCD bir karedir.

ABCD is a square.

$\Rightarrow \tan x = ?$

A) $\frac{4}{13}$ B) $\frac{6}{13}$ C) $\frac{9}{13}$ D) $\frac{5}{17}$ E) $\frac{7}{17}$

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1	2	3	4	5	6	7	8
B	C	E	A	C	D	B	C
9	10	11	12	13	14	15	
C	D	E	A	D	A	E	

1. $f(x) = 2\cdot\cos\left(\frac{\pi}{2}+x\right)+\sin x \Rightarrow \mathbf{f\left(\frac{\pi}{2}\right) = ?}$

A) $-\frac{1}{2}$ B) $-\frac{1}{3}$ C) $-\frac{1}{4}$ D) -1 E) $-\frac{1}{5}$

2. $f(x) = \cos(-x)-\sin(-x) \Rightarrow \mathbf{f\left(\frac{\pi}{4}\right) = ?}$

A) $\sqrt{2}$ B) $\frac{\sqrt{3}}{2}$ C) $-\frac{\sqrt{3}}{2}$ D) $\frac{1}{\sqrt{2}}$ E) $-\sqrt{2}$

3. $\tan^2x+\cot^2x = 11 \Rightarrow \mathbf{|\tan x-\cot x| = ?}$

A) 1 B) 3 C) 5 D) 7 E) 9

4. $\mathbf{\frac{1+\sin^3x}{1+\sin x}+\sin x = ?}$

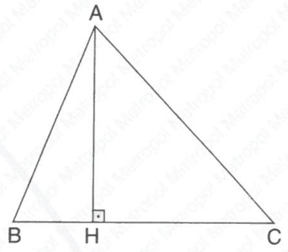
A) $\sin^2x$ B) $\cos^2x$ C) $1+\sin^2x$ D) $2-\sin^2x$ E) $2-\cos^2x$

5. $\mathbf{\frac{\sin x}{1+\cos x}-\operatorname{cosec} x = ?}$

A) $-\sin x$ B) $-\cos x$ C) $-\cot x$ D) $-\tan x$ E) $-\sec x$

6. $2\cdot|BC| = 3\cdot|AH|$

$\Rightarrow \mathbf{\cot\widehat{B}+\cot\widehat{C} = ?}$



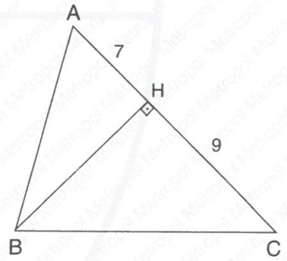
A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) 3

7. $|AH| = 7$ cm,

$|CH| = 9$ cm,

$\cot\widehat{A}+\cot\widehat{C} = 4$

$\Rightarrow \mathbf{A(\widehat{ABC}) = ?\,cm^2}$



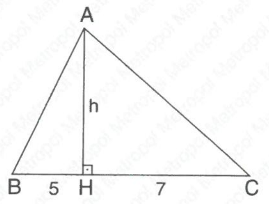
A) 128 B) 64 C) 32 D) 16 E) 8

8. $|BH| = 5$ cm,

$|CH| = 7$ cm,

$\tan\widehat{B}+\tan\widehat{C} = 3$

$\Rightarrow \mathbf{A(\widehat{ABC}) = ?\,cm^2}$



A) 50 B) 52 C) 52,5 D) 54 E) 54,5

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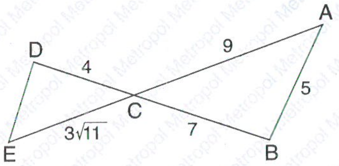
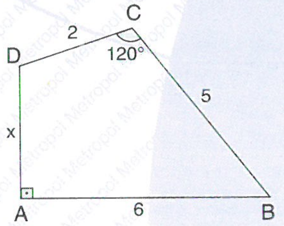
9.



$\Rightarrow$ **$A(\overset{\triangle}{DEC}) = ?$ cm^2**

A) 8 B) 11 C) 14 D) 17 E) 20

10.

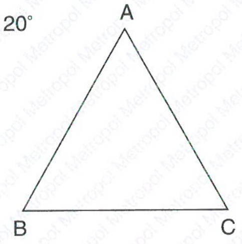


$\Rightarrow$ **$|AD| = x = ?$ cm**

A) $3\sqrt{3}$ B) $2\sqrt{3}$ C) $\sqrt{2}$ D) $\sqrt{3}$ E) 1

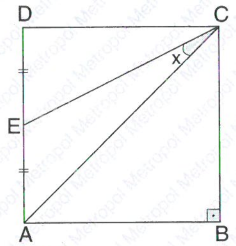
11. $m(\widehat{A}) + m(\widehat{B}) = 120°$

$\Rightarrow$ **$\cot\widehat{C} = ?$**



A) $\sqrt{3}$ B) $\frac{1}{\sqrt{3}}$ C) $\sqrt{2}$ D) $\frac{1}{\sqrt{2}}$ E) $2\sqrt{2}$

12.

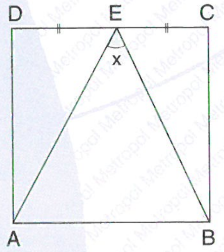


ABCD bir karedir. / ABCD is a square.

$|DE| = |AE| \Rightarrow$ **$\cot x = ?$**

A) 9 B) 3 C) 1 D) $\frac{1}{\sqrt{3}}$ E) $\frac{1}{3\sqrt{3}}$

13.

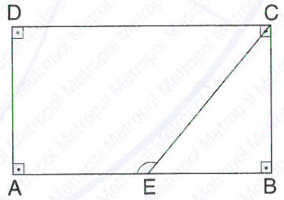


ABCD bir karedir. / ABCD is a square.

$|DE| = |EC|$, $m(\widehat{AEB}) = x \Rightarrow$ **$\tan x = ?$**

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) $\frac{4}{3}$ E) $\frac{5}{3}$

14.



$\sin(\widehat{ECB}) = \frac{2}{3} \Rightarrow$ **$\cos(\widehat{AEC}) = ?$**

A) $-\frac{7}{3}$ B) -2 C) $-\frac{5}{3}$ D) $-\frac{4}{3}$ E) $-\frac{2}{3}$

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1	2	3	4	5	6	7
D	A	B	C	C	C	C
8	9	10	11	12	13	14
C	B	D	B	B	D	E

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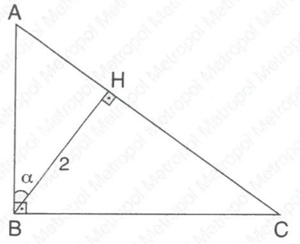
1.



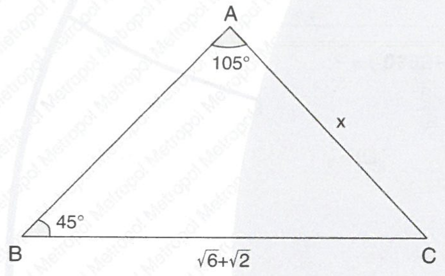
⇒ **|AC| = ?**

A) $2 \cdot \sec\alpha$ B) $2 \cdot \operatorname{cosec}\alpha$

C) $2 \cdot \tan\alpha$ D) $2\sec\alpha \cdot \operatorname{cosec}\alpha$

E) $\sec\alpha \cdot \operatorname{cosec}\alpha$

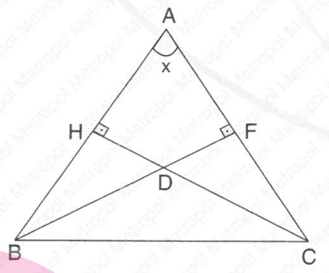
2.



⇒ **x = ?**

A) 1 B) $\sqrt{2}$ C) $\sqrt{3}$ D) 2 E) $2\sqrt{2}$

3.

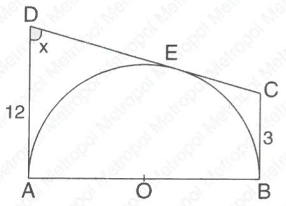


$m(\widehat{ABC}) = y$, $2 \cdot |CD| = 3 \cdot |HD|$

⇒ **tan x · tan y = ?**

A) 1 B) 2 C) $\frac{5}{2}$ D) 6 E) $\frac{13}{2}$

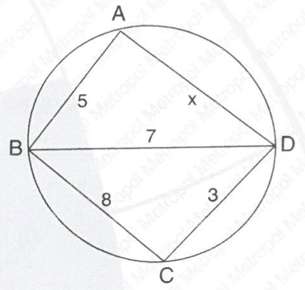
4.



⇒ **tan x = ?**

A) $\frac{3}{5}$ B) $\frac{4}{5}$ C) $\frac{3}{4}$ D) $\frac{4}{3}$ E) 1

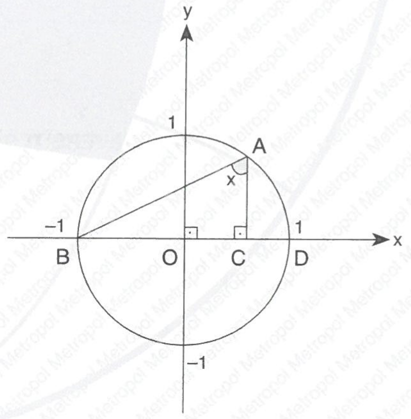
5.



⇒ **x = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

6.



$|OC| = 2 \cdot |CD|$ ⇒ **tan x = ?**

A) $\frac{1}{\sqrt{3}}$ B) $\frac{1}{\sqrt{5}}$ C) $\sqrt{3}$ D) 2 E) $\sqrt{5}$

YANITLAR / ANSWERS

1	2	3	4	5	6
D	E	C	D	A	E

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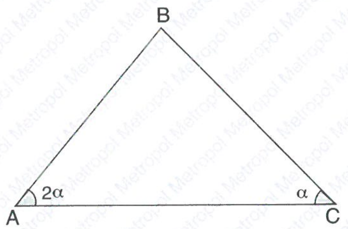
1.



|AB| = 8 , |BC| = 12 ⇒ **tan α = ?**

A) $\frac{\sqrt{7}}{7}$ B) $\frac{\sqrt{7}}{4}$ C) $\frac{\sqrt{3}}{4}$ D) $\frac{\sqrt{7}}{3}$ E) $\frac{3}{4}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

2. $\dfrac{\sin 20^\circ \cdot \cos 15^\circ + \cos 20^\circ \cdot \sin 15^\circ}{\cos 65^\circ \cdot \cos 10^\circ + \sin 65^\circ \cdot \sin 10^\circ} = ?$

A) −1 B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) 1

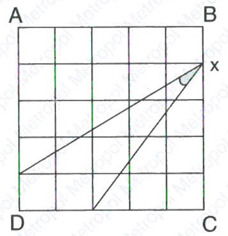
[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

3. $\left[\dfrac{\sin 2x}{2} + \dfrac{\sin^2 x}{\dfrac{1}{\tan x} + \operatorname{cosec} x}\right] : \cos x = ?$

A) sin x B) cos x C) tan x D) cot x E) 1

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

4.



⇒ **tan x = ?**

A) $\frac{11}{27}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) $\frac{9}{11}$ E) $\sqrt{6}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

5. $\sin(-2580^\circ) = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $-\frac{1}{2}$ D) $\frac{1}{2}$ E) −1

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

6. $\sin 45^\circ \cdot \cos 225^\circ + \tan 60^\circ \cdot \sin 120^\circ = ?$

A) 1 B) $3\sqrt{2}$ C) 2 D) $\sqrt{3} + \sqrt{2}$ E) $\sqrt{2}$

[AKDENİZ ÜNİVERSİTESİ – YÖS 2014]

YANITLAR / ANSWERS

1	2	3	4	5	6
D	E	C	A	A	A

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BÖLÜM CHAPTER 6

TARİHSEL NOT / HISTORICAL NOTE

SOFİA VASİLYEVNA KOVALEVSKAYA [1850 - 1891]

İlk büyük kadın Rus matematikçisidir. Analiz, diferansiyel denklemler ve mekanik alanlarına birçok orijinal katkıda bulunmuştur. Kuzey Avrupa'da ilk kez tam profesörlük alan kadındır. Ayrıca bilimsel bir dergide editör olarak çalışan ilk kadınlardandır.

The first Russian female mathematician. She made many original contributions to the analysis, differential equations and mechanical fields. She is the first woman to receive a full professorship in northern Europe. She is also one of the first women to work as an editor in a scientific journal.

TRİGONOMETRİ II
TRIGONOMETRY II

Bu bölüm 80 alıştırma sorusu, 180 test sorusu, 6 YÖS sorusu içermektedir.

This chapter includes 80 exercise questions, 180 test questions, and 6 YÖS questions.

BÖLÜM / CHAPTER 6

TRİGONOMETRİ II / TRIGONOMETRY II

- Trigonometri II / Trigonometry II .... 145 – 180

BÖLÜM 06 CHAPTER

TRİGONOMETRİ II
TRIGONOMETRY II

1. $\sin 75^\circ = ?$

Yanıt / The Answer is $\frac{\sqrt{6}+\sqrt{2}}{4}$

2. $\cos 105^\circ = ?$

Yanıt / The Answer is $\frac{\sqrt{2}-\sqrt{6}}{4}$

3. $\tan 15^\circ = ?$

Yanıt / The Answer is $2-\sqrt{3}$

4. $A = \tan 25^\circ + \tan 20^\circ$

$B = 1 - \tan 25^\circ \cdot \tan 20^\circ$

$\Rightarrow \frac{A}{B} = ?$

Yanıt / The Answer is 1

5. $A = \sin 75^\circ \cdot \cos 15^\circ$

$B = \sin 15^\circ \cdot \cos 75^\circ \Rightarrow A + B = ?$

Yanıt / The Answer is 1

6. $A = \sin 43^\circ \cdot \sin 17^\circ$

$B = \cos 43^\circ \cdot \cos 17^\circ \Rightarrow B - A = ?$

Yanıt / The Answer is $\frac{1}{2}$

7. $\frac{\cos 72^\circ \cdot \cos 12^\circ + \sin 72^\circ \cdot \sin 12^\circ}{\sin 45^\circ \cdot \cos 15^\circ + \cos 45^\circ \cdot \sin 15^\circ} = ?$

Yanıt / The Answer is $\frac{1}{\sqrt{3}}$

8. $\frac{\tan 95^\circ - \tan 35^\circ}{1 + \tan 95^\circ \cdot \tan 35^\circ} = ?$

Yanıt / The Answer is $\sqrt{3}$

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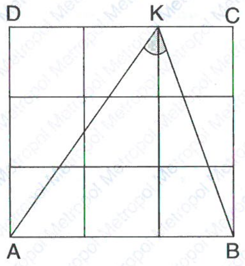
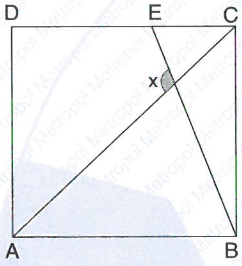
9. $\tan(\widehat{AKB}) = ?$



Yanıt / The Answer is $\frac{9}{7}$

---

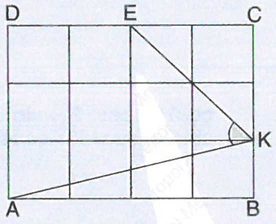
10. ABCD bir karedir.
ABCD is a square.
$|DE| = 3 \cdot |EC|$
$\Rightarrow$ **tan x = ?**



Yanıt / The Answer is $-\frac{5}{3}$

---

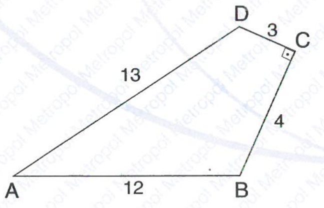
11. $\tan(\widehat{AKE}) = ?$



Yanıt / The Answer is $\frac{5}{3}$

---

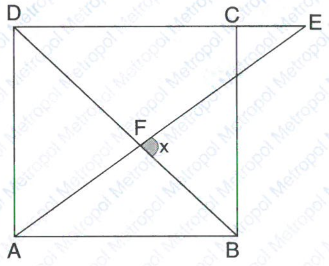
12. $\sin(\widehat{BAD}) = ?$



Yanıt / The Answer is $\frac{5}{13}$

---

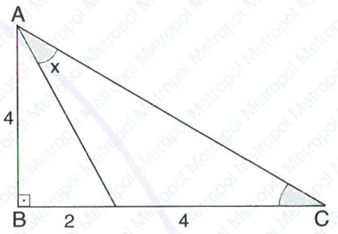
13. ABCD bir karedir.
ABCD is a square.
$|AB| = 2 \cdot |CE|$
$\Rightarrow$ **tan x = ?**



Yanıt / The Answer is 5

---

14. **tan x = ?**



Yanıt / The Answer is $\frac{4}{7}$

---

15. $2 \cdot \sin 15^\circ \cdot \cos 15^\circ = ?$

Yanıt / The Answer is $\frac{1}{2}$

---

16. $\sin x + \cos x = \frac{1}{2} \Rightarrow \sin 2x = ?$

Yanıt / The Answer is $-\frac{3}{4}$

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17. $A = \cos 15^\circ - \sin 15^\circ$

$B = \sin 15^\circ \cdot \cos 15^\circ \Rightarrow \mathbf{A^2 - 2B = ?}$

Yanıt / The Answer is **0**

18. $\tan x = \frac{1}{2} \Rightarrow \mathbf{\sin 2x = ?}$

Yanıt / The Answer is $\frac{4}{5}$

19. $\sin x - \cos x = \frac{1}{\sqrt{3}} \Rightarrow \mathbf{\cos 2x = ?}$

Yanıt / The Answer is $\frac{\sqrt{5}}{3}$

20. $0 < x < \frac{\pi}{4},\ \tan 2x = \frac{3}{4} \Rightarrow \mathbf{\tan x = ?}$

Yanıt / The Answer is $\frac{1}{3}$

21. $x + y = 30^\circ$

$\Rightarrow \mathbf{(\sin x + \cos y)^2 + (\sin y + \cos x)^2 = ?}$

Yanıt / The Answer is **3**

22. $\mathbf{\cos^2 75^\circ - \sin^2 75^\circ = ?}$

Yanıt / The Answer is $-\frac{\sqrt{3}}{2}$

23. $\mathbf{2 \cdot \cos^2 \frac{\pi}{8} - 1 = ?}$

Yanıt / The Answer is $\frac{\sqrt{2}}{2}$

24. $\mathbf{1 - 2 \cdot \sin^2 75^\circ = ?}$

Yanıt / The Answer is $-\frac{\sqrt{3}}{2}$

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25. $\dfrac{2 \cdot \tan 75^\circ}{1-\tan^2 75^\circ} = ?$

Yanıt / The Answer is $-\dfrac{1}{\sqrt{3}}$

26. $\sin 75^\circ \cdot \cos 75^\circ = ?$

Yanıt / The Answer is $\dfrac{1}{4}$

27. $\sin\dfrac{\pi}{6} \cdot \left(1-2 \cdot \sin^2\dfrac{\pi}{12}\right) = ?$

Yanıt / The Answer is $\dfrac{\sqrt{3}}{4}$

28. $\tan x = 2 \Rightarrow \cos 2x = ?$

Yanıt / The Answer is $-\dfrac{3}{5}$

29. $\sin 18^\circ = x \Rightarrow \cos 36^\circ = ?$

Yanıt / The Answer is $1-2x^2$

30. $\cos 12^\circ = x \Rightarrow \cos 24^\circ = ?$

Yanıt / The Answer is $2x^2-1$

31. $\dfrac{\cos 2x - 1}{\cos 2x + 1} = ?$

Yanıt / The Answer is $-\tan^2 x$

32. $\dfrac{\sin 2x}{\cos 2x - 1} = ?$

Yanıt / The Answer is $-\cot x$

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33. $\dfrac{\cos 2x + 1}{\sin 2x} = \dfrac{3}{4} \Rightarrow \sin x = ?$

Yanıt / The Answer is $\dfrac{4}{5}$

34. $\tan 8^\circ = x \Rightarrow \dfrac{1 + \cos 16^\circ}{\sin 16^\circ} = ?$

Yanıt / The Answer is $\dfrac{1}{x}$

35. $0 < x < \dfrac{\pi}{2}, \quad \dfrac{\cos 2x - 1}{\sin 2x} = -\sqrt{3} \Rightarrow \cos x = ?$

Yanıt / The Answer is $\dfrac{1}{2}$

36. $\dfrac{1 - \cos 24^\circ}{\sin 6^\circ \cdot \cos 6^\circ} = ?$

Yanıt / The Answer is $4 \cdot \sin 12^\circ$

37. $\dfrac{\sin 7x \cdot \cos 5x - \cos 7x \cdot \sin 5x}{\sin x \cdot \cos x} = ?$

Yanıt / The Answer is 2

38. $\dfrac{\cos 50^\circ \cdot \cos 16^\circ - \sin 50^\circ \cdot \sin 16^\circ}{2 \cdot \sin 12^\circ \cdot \cos 12^\circ} = ?$

Yanıt / The Answer is 1

39. $\dfrac{\sin 15^\circ}{\cos 15^\circ} + \dfrac{\cos 15^\circ}{\sin 15^\circ} = ?$

Yanıt / The Answer is 4

40. $\dfrac{\sin 3x}{\cos x} + \dfrac{\cos 3x}{\sin x} = ?$

Yanıt / The Answer is $2 \cdot \cot 2x$

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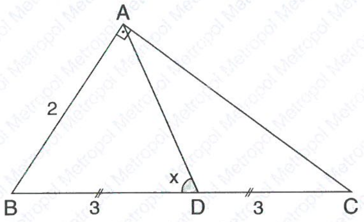
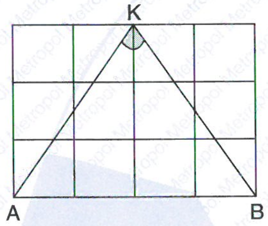
41. $\cos x = ?$



Yanıt / The Answer is $\frac{7}{9}$

---

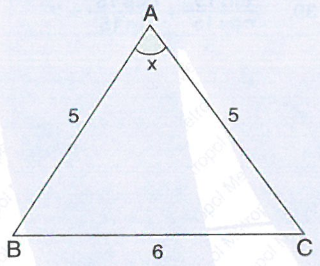
42. $\tan(\widehat{AKB}) = ?$



Yanıt / The Answer is $\frac{12}{5}$

---

43. $\cos x = ?$



Yanıt / The Answer is $\frac{7}{25}$

---

44. $0 < x < \frac{\pi}{4},\ \tan 2x = \frac{4}{3} \Rightarrow \tan x = ?$

Yanıt / The Answer is $\frac{1}{2}$

---

45. $0 < x < \frac{\pi}{4},\ \sin 2x = \frac{3}{5} \Rightarrow \tan x = ?$

Yanıt / The Answer is $\frac{1}{3}$

---

46. $\frac{\tan 45^\circ}{\sin 15^\circ} - \frac{\cot 45^\circ}{\cos 15^\circ} = ?$

Yanıt / The Answer is $2\sqrt{2}$

---

47. $(1 - 2 \cdot \sin^2(7{,}5)) \cdot \sin 15^\circ = ?$

Yanıt / The Answer is $\frac{1}{4}$

---

48. $\cot 2x = -5 \Rightarrow \frac{\sin^4 x - \cos^4 x}{\sin 2x} = ?$

Yanıt / The Answer is 5

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49. $(\sin 15^\circ + \cos 15^\circ)^2 - (\sin 15^\circ - \cos 15^\circ)^2 = ?$

Yanıt / The Answer is 1

50. $A = \sin 18^\circ \cdot \cos 36^\circ \Rightarrow A = ?$

Yanıt / The Answer is $\frac{1}{4}$

51. $\dfrac{\cos 6x - \cos 2x}{\sin 5x + \sin 3x} = ?$

Yanıt / The Answer is $-2 \cdot \sin x$

52. $\dfrac{\cos 40^\circ + \cos 20^\circ}{\sin 80^\circ} = ?$

Yanıt / The Answer is $\sqrt{3}$

53. $\dfrac{\sin 50^\circ + \sin 40^\circ}{\cos 50^\circ + \cos 40^\circ} = ?$

Yanıt / The Answer is 1

54. $\dfrac{\sin 6x - \sin 2x}{\cos 4x} = ?$

Yanıt / The Answer is $2 \cdot \sin 2x$

55. $8x = \pi \Rightarrow \dfrac{\sin 9x - \sin x}{\sin 7x + \sin x} = ?$

Yanıt / The Answer is -1

56. $\arcsin \dfrac{\sqrt{3}}{2} = ?$

Yanıt / The Answer is 60°

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57. $\arccos\frac{1}{2} = ?$

Yanıt / The Answer is $60°$

58. $\arctan\frac{1}{\sqrt{3}} = ?$

Yanıt / The Answer is $30°$

59. $\arcsin\frac{\sqrt{2}}{2} + \arccos\frac{\sqrt{3}}{2} = ?$

Yanıt / The Answer is $75°$

60. $\arccos\left(-\frac{1}{2}\right) + \arctan(-\sqrt{3}) = ?$

Yanıt / The Answer is $60°$

61. $\arccos\left(-\frac{\sqrt{3}}{2}\right) + \operatorname{arc}\cot(-1) = ?$

Yanıt / The Answer is $285°$

62. $\cos\left(\arcsin\frac{1}{2}\right) + \sin\left(\arccos\frac{\sqrt{3}}{2}\right) = ?$

Yanıt / The Answer is $\frac{\sqrt{3}+1}{2}$

63. $\sin\left(\arccos\frac{\sqrt{2}}{2}\right) + \cos\left(\arcsin\frac{\sqrt{2}}{2}\right) = ?$

Yanıt / The Answer is $\sqrt{2}$

64. $\tan\left(\arcsin\frac{5}{13}\right) = ?$

Yanıt / The Answer is $\frac{5}{12}$

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65. $\cos\left(\arcsin\frac{2\sqrt{2}}{3}\right) = ?$

Yanıt / The Answer is $\frac{1}{3}$

66. $\cos\left(2\pi - \arctan\frac{\sqrt{5}}{2}\right) = ?$

Yanıt / The Answer is $\frac{2}{3}$

67. $\tan\left(\frac{\pi}{2} - \arcsin\frac{2}{\sqrt{5}}\right) = ?$

Yanıt / The Answer is $\frac{1}{2}$

68. $\sin\left(\frac{\pi}{2} - \arctan\frac{4}{3}\right) = ?$

Yanıt / The Answer is $\frac{3}{5}$

69. $\arccos\left(\frac{x-2}{4}\right) = \frac{\pi}{3} \Rightarrow x = ?$

Yanıt / The Answer is 4

70. $\arcsin\left(\frac{3x+4}{3}\right) = \frac{\pi}{6} \Rightarrow x = ?$

Yanıt / The Answer is $-\frac{5}{6}$

71. $0 < x < 180°,\ \sin x = \frac{\sqrt{3}}{2} \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\{60°, 120°\}$

72. $0 < x < 2\pi,\ \cos x = \frac{1}{2} \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\left\{\frac{\pi}{3}, \frac{5\pi}{3}\right\}$

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73. $0 < x < 180°,\ \cos 2x = -1 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{90°\}$

---

74. $0 < x < \frac{\pi}{2},\ \sin 5x = \frac{1}{2} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\left\{\frac{\pi}{30}, \frac{13\pi}{30}\right\}$

---

75. $0 < x < 90°,\ \sin(3x + 25°) = \sin(85°) \Rightarrow$ **min(x) = ?**

Yanıt / The Answer is $20°$

---

76. $0 < x < \frac{\pi}{2},\ \cos\left(7x - \frac{\pi}{4}\right) = \cos\frac{\pi}{3} \Rightarrow$ **min(x) = ?**

Yanıt / The Answer is $\frac{\pi}{12}$

---

77. $0 < x < 90°,\ \tan x = 1 \Rightarrow$ **x = ?**

Yanıt / The Answer is $45°$

---

78. $0 < x < \pi,\ \tan\left(2x - \frac{\pi}{3}\right) = \frac{1}{\sqrt{3}} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\left\{\frac{\pi}{4}, \frac{3\pi}{4}\right\}$

---

79. $0 < x < 90°,\ \cot 3x = \frac{1}{\sqrt{3}} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{20°, 80°\}$

---

80. $x \in N^+,\ \sin(2x - 5) = \cos(4x + 11)$

$\Rightarrow$ **min(x) = ?**

Yanıt / The Answer is $14°$

METROPOL YAYINLARI • METROPOL PUBLICATIONS

1. $\cos65°\cdot\cos55° - \cos25°\cdot\cos35° = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) $\frac{\sqrt{3}}{2}$

2. $\frac{\cos24°}{\cos8°} - \frac{\sin24°}{\sin8°} = ?$

A) 2 B) $\frac{1}{2}$ C) $-\frac{1}{2}$ D) -1 E) -2

3. $\frac{\sin50°}{\sin20°} - \frac{\cos50°}{\cos20°} = ?$

A) sin40° B) cos40° C) sec40° D) cosec40° E) 2·cosec40°

4. $\frac{\cos35°\cdot\cos25° - \sin35°\cdot\sin25°}{2} = ?$

A) $\frac{1}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{1}{4}$ D) $\frac{\sqrt{3}}{4}$ E) 1

5. $\frac{\sin13°\cdot\cos15° + \sin15°\cdot\cos13°}{2\cdot\sin14°} = ?$

A) sin14° B) cos14° C) tan14° D) cot14° E) sec14°

6. $\frac{\sin20° + \sqrt{3}\cdot\cos20°}{\cos10°} = ?$

A) $-\frac{1}{2}$ B) 0 C) $\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$ E) 2

7. $\frac{\tan60° - \tan30°}{1 + \tan60°\cdot\tan30°} = ?$

A) $\frac{\sqrt{3}}{2}$ B) $\frac{\sqrt{6}}{2}$ C) $\sqrt{3}$ D) $\frac{\sqrt{3}}{3}$ E) 1

8. $\cos83°\cdot\cos38° + \sin83°\cdot\sin38° = ?$

A) $\frac{\sqrt{3}}{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{1}{2}$ D) $-\frac{\sqrt{2}}{2}$ E) $-\frac{\sqrt{3}}{2}$

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9. $x+y=\frac{5\pi}{6} \Rightarrow (\mathbf{sinx-cosy})^2+(\mathbf{siny-cosx})^2 = ?$

A) 1 B) 2 C) $2-\sqrt{3}$

D) $2-\frac{\sqrt{3}}{2}$ E) $\frac{3}{2}$

10. $\dfrac{\sin 84^\circ \cdot \cos 46^\circ + \cos 84^\circ \cdot \sin 46^\circ}{\cos 68^\circ \cdot \cos 18^\circ + \sin 68^\circ \cdot \sin 18^\circ} = ?$

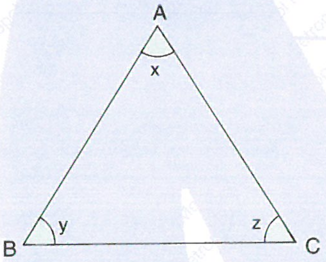
A) $-\cot 50^\circ$ B) $\cot 50^\circ$ C) $\tan 50^\circ$

D) $-\tan 50^\circ$ E) 1

11. $z < 90^\circ$,

$\text{sinx} \cdot \text{cosy} + \text{siny} \cdot \text{cosx} = \frac{1}{3}$

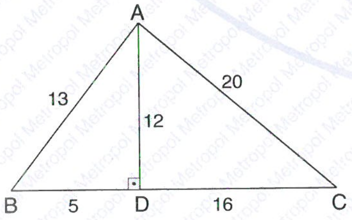
$\Rightarrow$ **cotz = ?**



A) $\frac{2}{3}$ B) $\frac{\sqrt{2}}{3}$ C) $2\sqrt{2}$

D) $\sqrt{2}$ E) 3

12.



$\Rightarrow \sin(\widehat{BAC}) = ?$

A) $\frac{3}{8}$ B) $\frac{1}{2}$ C) $\frac{27}{29}$

D) $\frac{63}{65}$ E) 1

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13. $\sin(-105^\circ) = ?$

A) $-\frac{\sqrt{2}}{4}$ B) $-\left(\frac{\sqrt{2}+\sqrt{6}}{4}\right)$ C) $-\frac{\sqrt{6}}{4}$

D) $\sqrt{2}$ E) $-\frac{1}{2}$

14. $\dfrac{\sin 22^\circ \cdot \cos 23^\circ + \sin 23^\circ \cdot \cos 22^\circ}{\cos 13^\circ \cdot \cos 17^\circ - \sin 17^\circ \cdot \sin 13^\circ} = ?$

A) $\frac{\sqrt{6}}{2}$ B) $\frac{\sqrt{6}}{3}$ C) $\frac{\sqrt{2}}{2}$

D) $\frac{\sqrt{3}}{3}$ E) 1

15. $\tan(x-45^\circ) = 4 \Rightarrow$ **cotx = ?**

A) -2 B) $-\frac{3}{5}$ C) $-\frac{1}{3}$ D) $\frac{1}{3}$ E) 1

16. $\tan\left(\frac{5\pi}{12}\right) = ?$

A) $2+\sqrt{3}$ B) 1 C) $2-\sqrt{3}$

D) $1+\sqrt{3}$ E) -2

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	E	D	C	B	E	D	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	C	C	D	B	B	B	A

1. $\sin 43^\circ \cdot \cos 17^\circ + \sin 47^\circ \cdot \sin 17^\circ = ?$

A) $\frac{1}{2}$ B) $\frac{\sqrt{3}}{2}$ C) 2 D) $-\frac{1}{2}$ E) $-\frac{\sqrt{3}}{2}$

2. $\frac{\sin 5a}{\sin a} - \frac{\cos 5a}{\cos a} = ?$

A) $\sin 2a$ B) $4 \cdot \sin 2a$ C) $\tan 2a$ D) $4 \cdot \cos 2a$ E) $4 \cdot \tan 2a$

3. $x + y = \frac{\pi}{3}$

$\Rightarrow (\sin x - \sin y)^2 + (\cos x + \cos y)^2 = ?$

A) $3\sqrt{3}$ B) $\sqrt{3}$ C) 3 D) $-\sqrt{3}$ E) $-3\sqrt{3}$

4. $\frac{\cos 129^\circ}{\cos 163^\circ} - \frac{\sin 129^\circ}{\sin 163^\circ} = ?$

A) –8 B) –6 C) –4 D) –2 E) –1

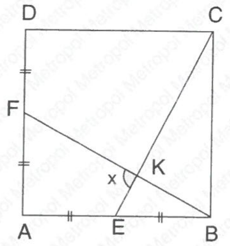
5. $\frac{\sin 3x}{\sin x} - \frac{\cos 3x}{\cos x} = ?$

A) 4 B) 3 C) 2 D) 1 E) 0

6. ABCD bir karedir.

ABCD is a square.

$\Rightarrow \cot x = ?$



A) $\frac{1}{\sqrt{3}}$ B) $\sqrt{3}$ C) 0 D) 1 E) ∞

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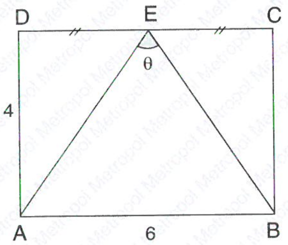
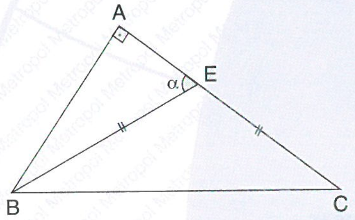
7.



$|DE| = |EC| \Rightarrow$ **sinθ = ?**

A) $\frac{7}{25}$ B) $\frac{12}{25}$ C) $\frac{13}{25}$ D) $\frac{17}{25}$ E) $\frac{24}{25}$

8.

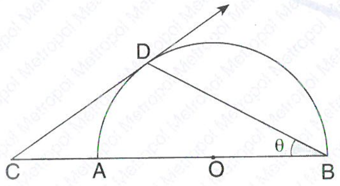


$|BE| = |EC|$, $\tan\alpha = 2\sqrt{2}$

$\Rightarrow$ **cos $\widehat{C}$ = ?**

A) $\sqrt{2}$ B) $\sqrt{3}$ C) $\sqrt{6}$ D) $\frac{\sqrt{6}}{2}$ E) $\frac{\sqrt{6}}{3}$

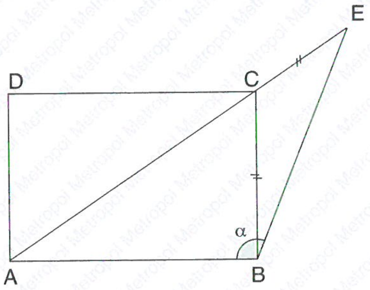
9.



$2\cdot|CA| = |AO| \Rightarrow$ **cosθ = ?**

A) $\sqrt{15}$ B) $\frac{\sqrt{15}}{6}$ C) $\sqrt{30}$ D) $\frac{\sqrt{30}}{6}$ E) $-\sqrt{30}$

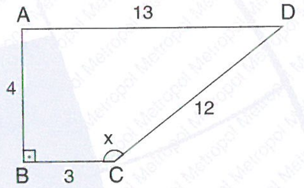
10.



$|EC| = |CB|$, $\frac{|AD|}{|AB|} = \frac{3}{4}$, $m(\widehat{EBA}) = \alpha \Rightarrow$ **tan α = ?**

A) $-\frac{3}{4}$ B) -1 C) -2 D) $-\frac{3}{2}$ E) $-\frac{4}{3}$

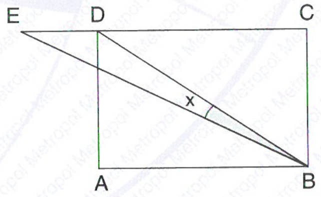
11.



$\Rightarrow$ **cosx = ?**

A) $-\frac{1}{5}$ B) $-\frac{3}{5}$ C) $-\frac{4}{5}$ D) $-\frac{9}{5}$ E) $-\frac{13}{5}$

12.



ABCD bir dikdörtgendir. ABCD is a rectangle.

$|DC| = 2\cdot|CB|$, $\frac{|DC|}{|DE|} = \frac{5}{2} \Rightarrow$ **tanx = ?**

A) $\frac{4}{33}$ B) $\frac{3}{33}$ C) $\frac{2}{33}$ D) $\frac{1}{33}$ E) $-\frac{4}{33}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
B	D	C	D	C	C	E	E	D	C	C	A

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1. $4 \cdot \sin 75^\circ \cdot \cos 75^\circ = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) $\frac{\sqrt{2}}{2}$ E) 1

2. $\sin\frac{\pi}{8}\left(2 \cdot \sin^2\frac{\pi}{16} - 1\right) = ?$

A) $-\frac{\sqrt{2}}{4}$ B) $-\frac{\sqrt{2}}{2}$ C) $\frac{1}{2}$ D) $\frac{\sqrt{2}}{2}$ E) $\frac{\sqrt{2}}{4}$

3. $\frac{\cos 2x}{\cos x + \sin x} = ?$

A) cosx – sinx B) 1 + sinx C) cosx + sinx D) cosx E) $\frac{2}{1+\cos x}$

4. $\frac{\sqrt{3}}{\cos 20^\circ} + \frac{1}{\sin 20^\circ} = ?$

A) $2 \cdot \cos 40^\circ$ B) $4 \cdot \cot 40^\circ$ C) $\tan 40^\circ$ D) $8 \cdot \cos 40^\circ$ E) $4 \cdot \cos 40^\circ$

5. $\frac{4 \cdot \sin 20^\circ \cdot \sin 70^\circ \cdot \cos 40^\circ}{\cos 10^\circ} = ?$

A) –2 B) –1 C) $\frac{1}{2}$ D) 1 E) 2

6. $\cos 40^\circ = 2m \Rightarrow \sin 25^\circ \cdot \sin 50^\circ \cdot \sin 65^\circ = ?$

A) $\frac{m^3}{2}$ B) $2m^3$ C) $\frac{m^2}{2}$ D) m^2 E) $2m^2$

7. $\sin 35^\circ = a$

$\Rightarrow \sin 160^\circ = ?$

A) $\sqrt{1-a^2}$ B) $1-2a^2$ C) $2a^2$ D) $\frac{\sqrt{1-a^2}}{2}$ E) $1-a^3$

8. $\cos 34^\circ = m \Rightarrow \sin 152^\circ \cdot \cos 28^\circ = ?$

A) 2m B) $\frac{m}{2}$ C) $\frac{m}{3}$ D) 3m E) $\frac{m}{4}$

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9. $\cos 25^\circ = a \Rightarrow \mathbf{\sin 320^\circ = ?}$

A) $2a^2-1$ B) $1-2a^2$ C) $2a\cdot\sqrt{1-a^2}$ D) $2a\cdot\sqrt{1+a^2}$ E) $4a^2$

10. $\cot x = 5 \Rightarrow \mathbf{\cos 2x = ?}$

A) $\frac{12}{13}$ B) $\frac{5}{13}$ C) $\frac{12}{5}$ D) $\frac{5}{26}$ E) $\frac{5}{12}$

11. $0 < x < \frac{\pi}{2}$,

$3\cdot\sin x - 4\cdot\cos x = 0$

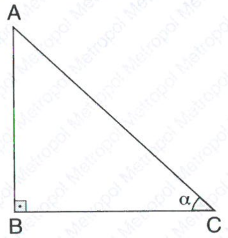
$\Rightarrow \mathbf{\sin 2x = ?}$

A) $-\frac{24}{25}$ B) $-\frac{12}{25}$ C) $\frac{7}{25}$ D) $\frac{12}{25}$ E) $\frac{24}{25}$

12. $\frac{\cos 75^\circ}{\cos 25^\circ} - \frac{\sin 75^\circ}{\sin 25^\circ} = ?$

A) -2 B) -1 C) $\frac{1}{2}$ D) 1 E) 2

13.



$3\cdot|AB| = 4\cdot|BC|$

$\Rightarrow \mathbf{\tan\frac{\alpha}{2} = ?}$

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{1}{4}$ E) $\frac{1}{5}$

14. $\tan x = \frac{\sqrt{3}}{2} \Rightarrow \mathbf{\cos 2x = ?}$

A) $\frac{\sqrt{3}}{5}$ B) $\frac{1}{5}$ C) $\frac{1}{7}$ D) $\frac{\sqrt{3}}{11}$ E) $\frac{3}{7}$

15. $\sin 74^\circ = x \Rightarrow \mathbf{\frac{\sin 24^\circ}{\sin 8^\circ} + \frac{\cos 24^\circ}{\cos 8^\circ} = ?}$

A) 5x B) 4x C) 3x D) 2x E) x

16. $\frac{\sin 144^\circ}{\sin 168^\circ} - \frac{\cos 144^\circ}{\cos 168^\circ} = ?$

A) 3 B) 2 C) 1 D) $\frac{1}{2}$ E) $\frac{\sqrt{3}}{2}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	A	A	B	D	E	B	B
9	10	11	12	13	14	15	16
B	A	E	A	B	C	B	B

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1. $(\sin x + \cos x)^2 - \tan x \cdot \cot x = ?$

A) $\cos 2x$ B) $\sin x$ C) $\sin 2x$ D) $\tan 2x$ E) $\cot 2x$

2. $\pi < x < \frac{3\pi}{2}$, $\sin x = -\frac{1}{2} \Rightarrow \cos 2x = ?$

A) $-\frac{1}{2}$ B) $\frac{1}{2}$ C) 1 D) 0 E) $\frac{\sqrt{3}}{2}$

3. $0 < x < \frac{\pi}{2}$, $\tan x = \frac{1}{2} \Rightarrow \cos 2x = ?$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

4. $\tan x = \frac{1}{2} \Rightarrow \tan 2x = ?$

A) $\frac{4}{3}$ B) 1 C) $\frac{2}{3}$ D) $\frac{1}{3}$ E) –1

5. $0° < x < 90°$,

$\sin x + \cos x = \frac{7}{5} \Rightarrow \sin 2x = ?$

A) $\frac{7}{25}$ B) $\frac{24}{25}$ C) 1 D) $-\frac{7}{25}$ E) $-\frac{24}{25}$

6. $2 \cdot \operatorname{cosec} 2x - \cot x = \frac{1}{2} \Rightarrow \tan 2x = ?$

A) $\frac{4}{3}$ B) $\frac{5}{3}$ C) 2 D) $\frac{7}{3}$ E) $\frac{8}{3}$

7. $\frac{\cos^4 x - \sin^4 x}{\sin 2x} = ?$

A) $\tan 2x$ B) $-\tan 2x$ C) $\cos 2x$ D) $\cot 2x$ E) $-\sec 2x$

8. $\frac{1 + \cos 2a}{\sin 2a} \cdot \frac{1 + \cos a}{\cos a} = ?$

A) $\tan \frac{a}{2}$ B) $\sin \frac{a}{2}$ C) $\cot \frac{a}{2}$ D) $\cos \frac{a}{2}$ E) $\sec \frac{a}{2}$

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9. $\cos 25^\circ = a \Rightarrow$ **$\sin 40^\circ = ?$**

A) $2a^2-1$ B) $2a^2+1$ C) $2a^2+2$ D) $2a^2-2$ E) $2a^2$

10. $\sin 16^\circ = a \Rightarrow$ **$\cos 148^\circ = ?$**

A) a^2 B) $2a$ C) $4a$ D) $2a^2$ E) $2a^2-1$

11. $\cos 65^\circ = m \Rightarrow$ **$\sin 40^\circ = ?$**

A) $1-m^2$ B) $1+m^2$ C) $2m^2-1$ D) $1-2m^2$ E) $1+2m^2$

12. $\cos 16^\circ = a \Rightarrow$ **$\cos 148^\circ = ?$**

A) $1-a^2$ B) $1+a^2$ C) $2a^2-1$ D) $1-2a^2$ E) $1+2a^2$

13. $\sin 17^\circ = x \Rightarrow$ **$\sin 56^\circ = ?$**

A) $1-x^2$ B) $1+x^2$ C) $2x^2-1$ D) $1-2x^2$ E) x^2

14. $\sin 20^\circ = m \Rightarrow$ **$(\sin 10^\circ - \cos 10^\circ)^2 = ?$**

A) m B) $2m$ C) $1+m$ D) $2-m$ E) $1-m$

15. $0^\circ < \alpha < 90^\circ$ ve (and) $\cos\alpha - \sin\alpha = \frac{1}{\sqrt{5}}$

$\Rightarrow$ **$\cos 4\alpha = ?$**

A) $-\frac{7}{24}$ B) $\frac{7}{24}$ C) 0 D) $\frac{7}{25}$ E) $-\frac{7}{25}$

16. $\cos 2x = a \Rightarrow$ **$\tan x = ?$**

A) a^2 B) $\sqrt{1-a}$ C) $\frac{\sqrt{1+a}}{\sqrt{1-a}}$ D) $\frac{\sqrt{1-a}}{\sqrt{1+a}}$ E) $\sqrt{1+a}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	C	A	B	A	D	C
9	10	11	12	13	14	15	16
A	E	D	D	D	E	E	D

1. $\dfrac{\cot x}{\tan x + \cot x} = 4\sin x - 3 \Rightarrow$ **sin x = ?**

A) $3-2\sqrt{2}$ B) $1-\sqrt{3}$ C) $-1+\sqrt{2}$ D) $-1+\sqrt{3}$ E) $-2+2\sqrt{2}$

2. **$\sin 10^\circ \cdot \sin 50^\circ \cdot \sin 70^\circ = ?$**

A) $\frac{1}{32}$ B) $\frac{1}{16}$ C) $\frac{1}{8}$ D) $\frac{1}{4}$ E) $\frac{1}{2}$

3. **$\cos 12^\circ \cdot \cos 24^\circ \cdot \cos 48^\circ \cdot \cos 96^\circ = ?$**

A) $-\frac{1}{32}$ B) $-\frac{1}{16}$ C) $-\frac{1}{8}$ D) $-\frac{1}{4}$ E) $-\frac{1}{2}$

4. **$\cos 20^\circ \cdot \cos 40^\circ \cdot \cos 80^\circ = ?$**

A) $\frac{1}{12}$ B) $\frac{1}{24}$ C) $\frac{1}{16}$ D) $\frac{1}{12}$ E) $\frac{1}{8}$

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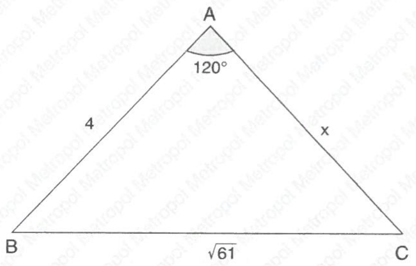
5.



$\Rightarrow$ **x = ?**

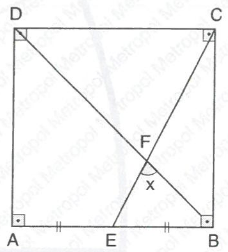
A) 5 B) 6 C) 7 D) 8 E) 9

6. ABCD bir karedir.

ABCD is a square.

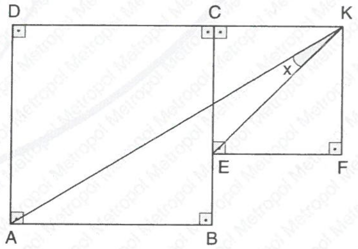
|AE| = |EB|

$\Rightarrow$ **tanx = ?**



A) $\sqrt{3}+\frac{1}{2}$ B) 3 C) $\frac{5\sqrt{3}}{6}$ D) 2 E) $\sqrt{3}-\frac{1}{2}$

7.



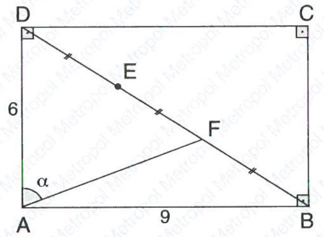
ABCD ve EFKC birer karedir.

ABCD and EFKC are squares.

|DC| = 3·|KC|, $m(\widehat{AKE}) = x \Rightarrow$ **cosx = ?**

A) $\frac{\sqrt{2}}{10}$ B) $\frac{1}{\sqrt{5}}$ C) $\frac{7\sqrt{2}}{10}$ D) $\frac{2\sqrt{2}}{5}$ E) $\frac{7\sqrt{10}}{5}$

8.



ABCD bir dikdörtgendir. / ABCD is a rectangle.

$|DE| = |EF| = |FB|$, $m(\widehat{DAF}) = \alpha$

$\Rightarrow$ **cot α = ?**

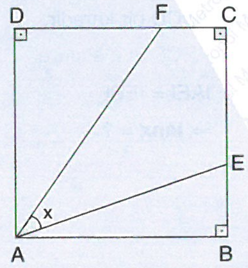
A) $\frac{2}{3}$ B) $\frac{4}{9}$ C) $\frac{1}{3}$ D) $\frac{2}{9}$ E) $\frac{2}{5}$

9. ABCD bir karedir.

ABCD is a square.

$\frac{|CE|}{|EB|} = \frac{|DF|}{|FC|} = 2$

$\Rightarrow$ **cotx = ?**



A) 1 B) $\sqrt{2} + 1$ C) $\frac{9}{7}$ D) 2 E) $\frac{4}{3}$

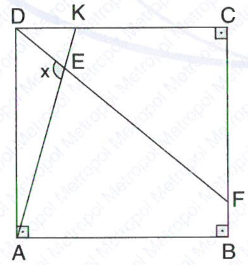
10. ABCD bir karedir.

ABCD is a square.

$|CF| = 3 \cdot |FB|$,

$|KC| = 2 \cdot |KD|$

$\Rightarrow$ **tanx = ?**



A) –6 B) –5 C) –4 D) –3 E) –2

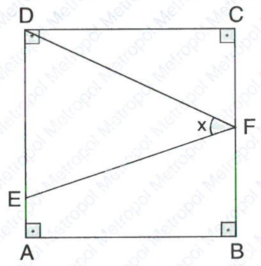
11. ABCD bir karedir.

ABCD is a square.

$|CF| = |FB|$,

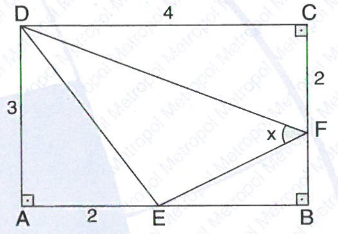
$4 \cdot |AE| = |AD|$

$\Rightarrow$ **tanx = ?**



A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{5}{7}$ E) $\frac{6}{7}$

12.

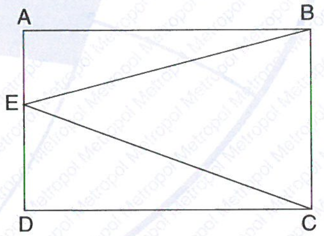


ABCD bir dikdörtgendir. / ABCD is a rectangle.

$\Rightarrow$ **cosx = ?**

A) $\frac{3}{\sqrt{13}}$ B) $\frac{5}{\sqrt{13}}$ C) $-\frac{1}{3}$ D) $\frac{4}{5}$ E) $\frac{3}{5}$

13.



ABCD bir dikdörtgendir. / ABCD is a rectangle.

$|AB| = 6 \cdot |AE| = 3 \cdot |ED|$

$\Rightarrow$ **$\cot(\widehat{BEC})$ = ?**

A) $\frac{4}{5}$ B) 1 C) $\frac{7}{5}$ D) $\frac{15}{11}$ E) $\frac{17}{9}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12	13
E	C	B	E	A	B	C	C	C	D	E	E	E

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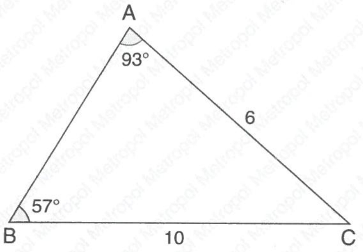
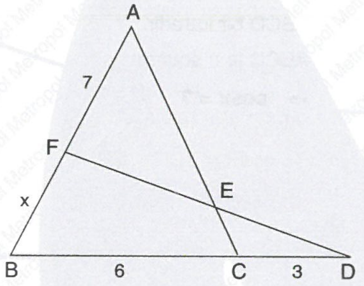
1. $A(\widehat{ABC}) = ?\ br^2 (u^2)$



A) 15 B) 20 C) 28 D) 30 E) 36

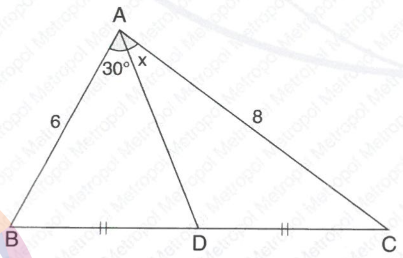
2. $A(\widehat{ABC}) = 3 \cdot A(\widehat{BDF})$

$\Rightarrow x = ?$ **br (u)**



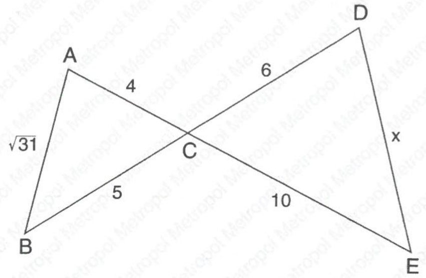
A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

3. **sinx = ?**



A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) $\frac{3}{8}$ D) $\frac{1}{2}$ E) $\frac{5}{8}$

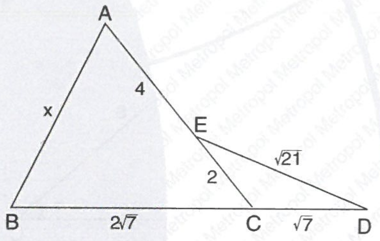
4.



$\Rightarrow x = ?$ **br (u)**

A) $\sqrt{53}$ B) $\sqrt{73}$ C) $\sqrt{86}$ D) $\sqrt{106}$ E) $\sqrt{110}$

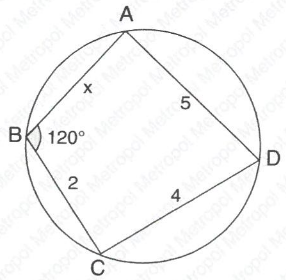
5.



$\Rightarrow x = ?$ **br (u)**

A) 2 B) $\sqrt{5}$ C) $\sqrt{7}$ D) 3 E) $\sqrt{14}$

6. **|AB| = x = ? br (u)**



A) $\sqrt{2} - 1$ B) $2\sqrt{2} - 1$ C) $3\sqrt{2} - 1$ D) $\sqrt{2} + 1$ E) $2\sqrt{2} + 1$

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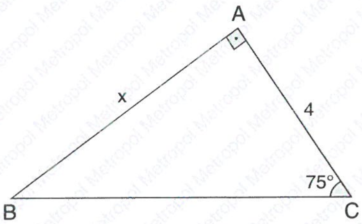
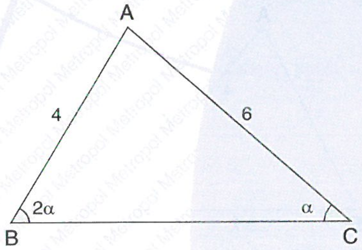
7. $|AB| = x = ?$ br (u)



A) $2 + \sqrt{3}$ B) $2\cdot(2 + \sqrt{3})$ C) $3\cdot(2+\sqrt{3})$ D) $4\cdot(2 + \sqrt{3})$ E) $6\cdot(2 + \sqrt{3})$

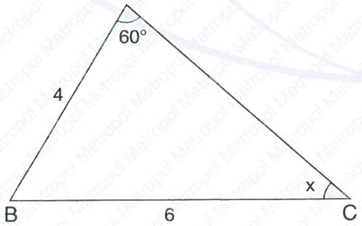
8.



$\Rightarrow \cos 2\alpha = ?$

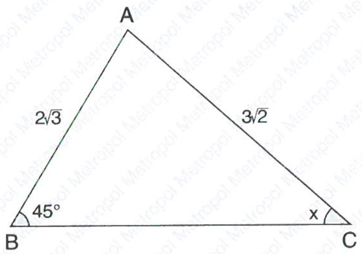
A) $\frac{7}{16}$ B) $\frac{3}{16}$ C) $\frac{1}{8}$ D) $\frac{3}{8}$ E) $\frac{1}{4}$

9. $\cos x = ?$



A) $\frac{\sqrt{3}}{3}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{\sqrt{6}}{2}$ D) $\frac{\sqrt{6}}{3}$ E) $\frac{\sqrt{6}}{4}$

10. $\tan x = ?$

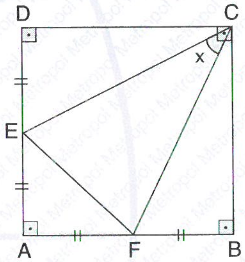


A) $\frac{1}{\sqrt{3}}$ B) $\frac{1}{\sqrt{2}}$ C) 1 D) 2 E) 3

11. ABCD bir karedir.

ABCD is a square.

$\Rightarrow \cos x = ?$



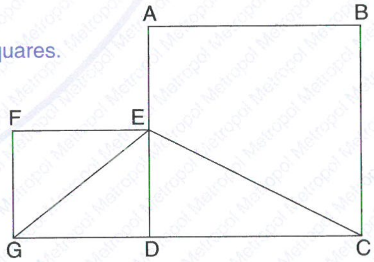
A) $\frac{1}{5}$ B) $\frac{1}{2}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) $\frac{\sqrt{2}}{5}$

12. ABCD ve EDGF kare /

ABCD and EDGF are squares.

$|AB| = 2\cdot|FE|$

$\Rightarrow \tan(\widehat{GEC}) = ?$



A) –3 B) –2 C) $\frac{2}{3}$ D) $\frac{5}{3}$ E) 2

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1	2	3	4	5	6	7	8	9	10	11	12
A	C	C	D	A	C	D	C	D	B	D	A

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1. $\sin 75° + \sin 15° = ?$

A) $\frac{\sqrt{6}}{2}$ B) $\frac{\sqrt{6}}{3}$ C) $\frac{\sqrt{6}}{4}$ D) $\frac{\sqrt{6}}{5}$ E) 1

2. $\cos 15° - \sin 15° = ?$

A) $\frac{\sqrt{2}}{2}$ B) $\frac{\sqrt{6}}{2}$ C) $2\sqrt{6}$ D) $-\frac{\sqrt{2}}{2}$ E) $\frac{\sqrt{6}-\sqrt{2}}{2}$

3. $\sin 54° - \sin 18° = ?$

A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $-\frac{1}{2}$ D) $-\frac{1}{4}$ E) $\frac{5}{8}$

4. $\cos 144° + \cos 72° = ?$

A) -2 B) $-\frac{3}{2}$ C) $-\frac{1}{2}$ D) $\frac{1}{2}$ E) 2

5. $\frac{\sin 3x + \sin 5x}{\cos 3x + \cos 5x} = ?$

A) sin2x B) cos2x C) cot2x D) tan2x E) tan4x

6. $\frac{\sin x + \sin 3x}{\cos x - \cos 3x} = ?$

A) tan2x B) cot2x C) cotx D) tanx E) tan3x

7. $\frac{\cos 50° + \cos 10°}{\sin 50° + \sin 10°} = ?$

A) $-\sqrt{3}$ B) -1 C) 0 D) $\frac{\sqrt{3}}{3}$ E) $\sqrt{3}$

8. $\frac{\sin 3x + \sin 5x + \sin 7x}{\cos 3x + \cos 5x + \cos 7x} = ?$

A) sin5x B) cos5x C) tan5x D) cot5x E) 1

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9. $\dfrac{\sin 20^\circ + \sin 60^\circ + \sin 100^\circ}{\cos 20^\circ + \cos 60^\circ + \cos 100^\circ} = ?$

A) 0 B) $\frac{\sqrt{3}}{3}$ C) 1 D) $\sqrt{3}$ E) $2\sqrt{3}$

10. $\dfrac{\cos x + \cos 6x + \cos 11x}{\sin x + \sin 6x + \sin 11x} = ?$

A) $\cot 6x$ B) $\cot 18x$ C) 1 D) $\cot x + \cot 6x + \cot 11x$ E) 0

11. $\dfrac{\sin 10x - \sin 8x + \sin 6x}{\cos 10x - \cos 8x + \cos 6x} = ?$

A) $-\tan 4x$ B) $\cot 4x$ C) $-\tan 8x$ D) $\tan 8x$ E) $\cot 8x$

12. $14x = \pi \Rightarrow \dfrac{4 \cdot \cos 3x \cdot \cos x}{\cos 12x + \cos 10x}$

A) -4 B) -3 C) -2 D) -1 E) 0

13. $11x = \frac{\pi}{2} \Rightarrow \dfrac{4 \cdot \sin x \cdot \cos 4x}{\cos 14x + \cos 6x} = ?$

A) 1 B) 2 C) 3 D) 4 E) 6

14. $19x = \pi \Rightarrow \dfrac{2 \cdot \cos 3x \cdot \cos 15x}{\cos x + \cos 7x} = ?$

A) 2 B) 1 C) $\frac{1}{2}$ D) $-\frac{1}{2}$ E) -1

15. $26a = \pi \Rightarrow \dfrac{\sin 10a + \sin 6a}{\cos 5a \cdot \cos 2a} = ?$

A) 1 B) $\frac{3}{2}$ C) 0 D) 2 E) $\frac{1}{2}$

16. $\cos x \cdot \cos 2x = \dfrac{1}{16 \cdot \sin x}$

$\Rightarrow \sin 4x = ?$

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{1}{4}$ D) $\frac{\sqrt{2}}{2}$ E) $\frac{\sqrt{3}}{2}$

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1	2	3	4	5	6	7	8
A	A	A	C	E	C	E	C
9	10	11	12	13	14	15	16
D	A	D	C	B	E	D	C

1. $\cos 20^\circ + \cos 100^\circ - \sin 50^\circ = ?$

A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) 0 D) – 1 E) 1

2. $\frac{1}{\cos 75^\circ} + \frac{1}{\sin 75^\circ} = ?$

A) $2\sqrt{6}$ B) $\sqrt{6}$ C) $\frac{\sqrt{3}}{2}$ D) $-\frac{\sqrt{3}}{2}$ E) $-2\sqrt{6}$

3. $x = \frac{\pi}{10} \Rightarrow \frac{\cos 13x + \cos 3x}{\sin 7x + \sin 3x} = ?$

A) cot3x B) sin5x C) tan5x D) cot5x E) – cot5x

4. $\frac{\sin 10^\circ + \sin 30^\circ + \sin 50^\circ}{\cos 10^\circ + \cos 30^\circ + \cos 50^\circ} = ?$

A) $\frac{1}{2}$ B) $\frac{1}{\sqrt{3}}$ C) $\frac{1}{\sqrt{2}}$ D) 2 E) 1

5. $\frac{\cos 7x + \cos 5x + \cos x}{\sin 7x - \sin 5x + \sin x} = ?$

A) tanx B) cotx C) –cosx D) –cot5x E) cot7x

6. $2 \cdot \sin 50^\circ \cdot \cos 20^\circ - \sin 70^\circ = ?$

A) 2 B) $\frac{1}{2}$ C) $-\frac{1}{2}$ D) – 2 E) 0

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7. ABCD bir karedir.

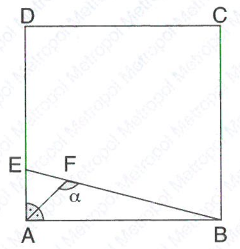
ABCD is a square.

$m(\widehat{EAF}) = m(\widehat{FAB})$,

$|DE| = 2 \cdot |EA|$,

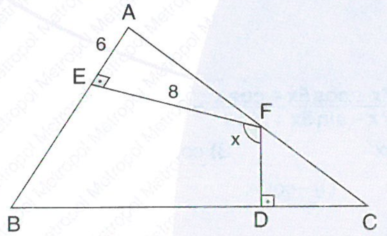
$m(\widehat{AFB}) = \alpha$

$\Rightarrow$ **tanα =?**



A) $-\sqrt{3}$ B) $-\sqrt{2}$ C) -1 D) -2 E) -3

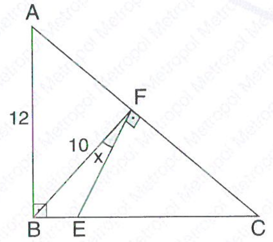
8.



$|AC| = |CB|$ $\Rightarrow$ **tanx = ?**

A) $-\frac{5}{3}$ B) $-\frac{4}{3}$ C) -1 D) -2 E) -3

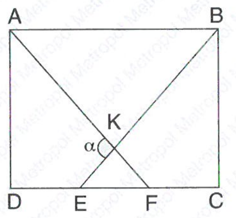
9.



$|AF| = |FC| \Rightarrow$ **cotx = ?**

A) $\frac{1}{7}$ B) $\frac{2}{7}$ C) $\frac{3}{7}$ D) $\frac{8}{7}$ E) $\frac{24}{7}$

10.



$|DC| = 3 \cdot |AD|$, $|DE| = |EF| = |FC| \Rightarrow$ **tanα = ?**

A) $\frac{4}{3}$ B) $\frac{8}{3}$ C) $\frac{16}{3}$ D) $\frac{20}{3}$ E) $\frac{24}{5}$

11. $\sin 4x \cdot \cot 2x = \dfrac{8\tan^2 x}{\tan^4 x + 2\tan^2 x + 1} \Rightarrow$ **x = ?**

A) $22,5^\circ$ B) 45° C) $67,5^\circ$ D) 75° E) 90°

12. $x \in \left(0, \frac{\pi}{2}\right]$,

$\dfrac{\sin 2x + 2\cos^2 x - 1}{\cos x - \sin x - \cos 3x + \sin 3x} = \dfrac{1}{\sec x} \Rightarrow$ **x = ?**

A) 15° B) 30° C) 45° D) 60° E) 90°

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1	2	3	4	5	6	7	8	9	10	11	12
C	A	E	B	B	B	D	B	E	A	A	C

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1. $\arctan 1 = ?$

A) $\frac{\pi}{12}$ B) $\frac{\pi}{8}$ C) $\frac{\pi}{6}$ D) $\frac{\pi}{4}$ E) 2π

2. $\arctan\sqrt{3} + \text{arccot}\frac{1}{\sqrt{3}} = ?$

A) $\frac{5\pi}{6}$ B) $\frac{3\pi}{4}$ C) $\frac{2\pi}{3}$ D) $\frac{\pi}{2}$ E) $\frac{\pi}{3}$

3. $\arctan(-\sqrt{3}) = ?$

A) $\frac{\pi}{6}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{3}$ D) $-\frac{\pi}{3}$ E) $-\frac{\pi}{6}$

4. $\arcsin\left(\frac{\sqrt{3}}{2}\right) + \arccos\left(\frac{1}{2}\right) = ?$

A) $\frac{\pi}{3}$ B) $\frac{\pi}{2}$ C) $\frac{2\pi}{3}$ D) $\frac{3\pi}{4}$ E) $\frac{5\pi}{6}$

5. $\arcsin\left(-\frac{1}{2}\right) = ?$

A) $-\frac{\pi}{3}$ B) $-\frac{\pi}{6}$ C) $\frac{\pi}{6}$ D) $\frac{\pi}{3}$ E) $\frac{5\pi}{6}$

6. $\arcsin\frac{\sqrt{3}}{2} - 2 \cdot \arctan 1 = ?$

A) $-\frac{\pi}{6}$ B) $-\frac{\pi}{4}$ C) $-\frac{\pi}{3}$ D) $\frac{\pi}{3}$ E) $\frac{\pi}{6}$

7. $\sin\left(\arccos\frac{1}{2}\right) = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) $\frac{\sqrt{3}}{2}$

8. $\sin(\arctan(-1)) = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{\sqrt{2}}{2}$ C) $-\frac{1}{2}$ D) $\frac{1}{2}$ E) $\frac{\sqrt{2}}{2}$

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9. $\tan\left(\arcsin\frac{5}{13}\right) = ?$

A) $\frac{1}{2}$ B) $\frac{5}{12}$ C) $\frac{1}{4}$ D) $\frac{7}{12}$ E) $\frac{2}{3}$

10. $\cos\left(\arcsin\frac{\sqrt{3}}{2}\right) = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) $\frac{\sqrt{2}}{2}$ E) $\frac{\sqrt{3}}{2}$

11. $\cot\left(\arcsin\frac{3}{5}\right) = ?$

A) 2 B) $\frac{3}{2}$ C) $\frac{4}{3}$ D) $\frac{2}{3}$ E) $\frac{3}{4}$

12. $\tan\left(\arcsin\frac{1}{2}\right) = ?$

A) $\frac{\sqrt{2}}{3}$ B) $\frac{1}{\sqrt{3}}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{3}{2}$ E) $\frac{4}{3}$

13. $\cot\left(2 \cdot \arcsin\frac{4}{5}\right) = ?$

A) $-\frac{7}{24}$ B) $\frac{7}{24}$ C) $\frac{23}{24}$ D) $\frac{4}{3}$ E) $\frac{24}{7}$

14. $\tan\left(2 \cdot \arctan\frac{1}{3}\right) = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{3}{4}$ D) 1 E) $\frac{4}{3}$

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15. $\sin\left(\text{arccot}\frac{1}{4}\right) = ?$

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{1}{\sqrt{17}}$ E) $\frac{4}{\sqrt{17}}$

16. $\tan\left(\frac{\pi}{2} + \arcsin\frac{3}{5}\right) = ?$

A) -1 B) $-\frac{4}{3}$ C) $-\frac{3}{4}$ D) $-\frac{1}{3}$ E) $\frac{2}{3}$

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1	2	3	4	5	6	7	8
D	C	D	C	B	A	E	B
9	10	11	12	13	14	15	16
B	C	C	B	A	C	E	B

1. $\tan\left(\arcsin\frac{1}{3}\right) = ?$

A) $2\sqrt{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{\sqrt{2}}{4}$ D) $\frac{2\sqrt{2}}{3}$ E) $\sqrt{2}$

2. $\sin\left(2 \cdot \text{arccot}\frac{1}{2}\right) = ?$

A) $\frac{1}{6}$ B) $\frac{2}{5}$ C) $\frac{4}{5}$ D) $\frac{2}{3}$ E) $\frac{3}{4}$

3. $\sin\left(\frac{\pi}{2} - \arccos\frac{4}{5}\right) = ?$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) $\frac{5}{4}$

4. $\cot\left(\arcsin\frac{3}{5} + \arccos\frac{3}{5}\right) = ?$

A) -1 B) 0 C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

5. $\arctan\frac{2}{3} + \arctan\frac{1}{5} = ?$

A) $\frac{\pi}{3}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{6}$ D) $\frac{\pi}{8}$ E) $\frac{\pi}{12}$

6. $\sin\left(\frac{\pi}{2} + 2 \cdot \arctan\frac{3}{4}\right) = ?$

A) $\frac{3}{5}$ B) $\frac{2}{5}$ C) $\frac{9}{25}$ D) $\frac{8}{25}$ E) $\frac{7}{25}$

7. $\tan\left(\frac{\pi}{2} + \arccos\frac{3}{5}\right) = ?$

A) $-\frac{4}{3}$ B) $-\frac{3}{4}$ C) $\frac{3}{4}$ D) $\frac{3}{5}$ E) $\frac{4}{3}$

8. $\cos\left(\arctan\frac{3}{4} + \arcsin\frac{12}{13}\right) = ?$

A) $-\frac{16}{65}$ B) $-\frac{12}{65}$ C) 0 D) $\frac{16}{65}$ E) $\frac{12}{65}$

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9. $\tan\left(\arctan\frac{1}{4}+\arctan\frac{1}{3}\right)=?$

A) $\frac{7}{6}$ B) $\frac{7}{8}$ C) $\frac{7}{9}$ D) $\frac{7}{10}$ E) $\frac{7}{11}$

10. $\sin\left(\arcsin\frac{1}{2}+\arccos\frac{4}{5}\right)=?$

A) $\frac{2+\sqrt{3}}{10}$ B) $\frac{2+3\sqrt{3}}{10}$ C) $\frac{4+\sqrt{3}}{10}$ D) $\frac{4+3\sqrt{3}}{10}$ E) $\frac{4+2\sqrt{3}}{10}$

11. $\arctan x+\operatorname{arccot} x=?$

A) $\frac{\pi}{6}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{2}$ E) π

12. $\arctan 4x=\operatorname{arccot} x \Rightarrow x=?$

A) $\frac{1}{8}$ B) $\frac{1}{6}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

13. $\arcsin x=\arctan 2$
$\Rightarrow x=?$

A) $\frac{1}{\sqrt{5}}$ B) $\frac{2}{\sqrt{5}}$ C) $\frac{3}{\sqrt{5}}$ D) $\frac{4}{\sqrt{5}}$ E) $\frac{6}{\sqrt{5}}$

14. $\arctan\left(-\frac{\sqrt{3}}{3}\right)+\arccos\left(-\frac{\sqrt{3}}{2}\right)=?$

A) $\frac{\pi}{3}$ B) $\frac{\pi}{2}$ C) π D) $\frac{5\pi}{3}$ E) $\frac{2\pi}{3}$

15. $\cos\left(\arccos\frac{1}{4}\right)+\sin(\arccos 0)=?$

A) $\frac{4}{5}$ B) 1 C) $\frac{5}{4}$ D) $\frac{3}{2}$ E) $\frac{4}{5}$

16. $\cot\left(\arcsin\frac{1}{2}\right)+\tan(\arccos(-1))=?$

A) $-\frac{\sqrt{3}}{3}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) $\sqrt{3}$ E) $\sqrt{3}+1$

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1	2	3	4	5	6	7	8
C	C	D	B	B	E	B	A
9	10	11	12	13	14	15	16
E	D	D	D	B	E	C	D

1. $\dfrac{\sin 20^\circ \cdot \cos 15^\circ + \cos 20^\circ \cdot \sin 15^\circ}{\cos 235^\circ} = ?$

A) -5 B) -4 C) -3 D) -2 E) -1

2. $\dfrac{\cos 63^\circ}{\sin 9^\circ} - \dfrac{\sin 63^\circ}{\cos 9^\circ} = ?$

A) 2 B) 6 C) 8 D) 10 E) 12

3. $\dfrac{\sin 5\theta}{\sin\theta} - \dfrac{\cos 5\theta}{\cos\theta} = ?$

A) $\tan 2\theta$ B) $\cos 2\theta$ C) $4 \cdot \tan 2\theta$ D) $4 \cdot \cos 2\theta$ E) $4 \cdot \sec\theta$

4. $\dfrac{\sin 144^\circ}{\sin 168^\circ} + \dfrac{\cos 144^\circ}{\cos 168^\circ} = ?$

A) $\sin 24^\circ$ B) $\cos 24^\circ$ C) $4 \cdot \sin 24^\circ$ D) $4 \cdot \cos 24^\circ$ E) $\tan 66^\circ$

5. $\sin 20^\circ \cdot \cos 20^\circ \cdot \sin 180^\circ = ?$

A) 0 B) 1 C) 2 D) $\frac{1}{2}$ E) $-\frac{1}{2}$

6. $\cos 20^\circ \cdot \cos 40^\circ \cdot \cos 60^\circ \cdot \cos 80^\circ = ?$

A) $\frac{1}{2}$ B) $\frac{1}{8}$ C) $\frac{1}{16}$ D) -2 E) -8

7. $a = \frac{\pi}{2} \Rightarrow \dfrac{1}{\sin a} - \dfrac{1}{\sin 3a} = ?$

A) 9 B) 6 C) 3 D) 2 E) 1

8. $\dfrac{\sin 78^\circ + \cos 48^\circ}{\cos 42^\circ + \sin 12^\circ} = ?$

A) $\sqrt{3}$ B) $\sqrt{2}$ C) 0 D) $-\sqrt{2}$ E) $-\sqrt{3}$

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9. $11x = \frac{\pi}{2} \Rightarrow \frac{4 \cdot \sin x \cdot \cos 4x}{\cos 14x + \cos 6x} = ?$

A) -1 B) 1 C) 2 D) $\frac{1}{2}$ E) $-\frac{1}{2}$

10. $\frac{\cos 20^\circ \cdot \sin 15^\circ + \sin 25^\circ \cdot \cos 20^\circ}{\cos 50^\circ} = ?$

A) $\sin 5^\circ$ B) $\sin 10^\circ$ C) $\tan 5^\circ$ D) $-\cos 5^\circ$ E) $\cos 5^\circ$

11. $0 \le x \le 360^\circ$,

$\arcsin\frac{\sqrt{3}}{2} = 3x \Rightarrow x = ?$

A) 20° B) 30° C) 45° D) $67{,}5^\circ$ E) 75°

12. $\arcsin 1 - \arcsin\frac{1}{2} = ?$

A) $\frac{\pi}{9}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{2}$ E) π

13. $\tan\left(\arcsin\frac{\sqrt{3}}{2} + \arccos\frac{\sqrt{2}}{2}\right) = ?$

A) $2+\sqrt{3}$ B) $2-\sqrt{3}$ C) $-2-\sqrt{3}$ D) $\sqrt{3}$ E) $-3\sqrt{3}$

14. $\arctan(4+3\sqrt{3}) - \arctan(6-3\sqrt{3}) = ?$

A) π B) $\frac{\pi}{2}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{4}$ E) $-\pi$

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1	2	3	4	5	6	7
E	A	D	D	A	C	D
8	**9**	**10**	**11**	**12**	**13**	**14**
A	C	E	A	C	C	D

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1. $0 < x < \frac{\pi}{2}$, $\sin x = \frac{1}{2} \Rightarrow$ **x = ?**

A) $\frac{\pi}{3}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{6}$ D) $\frac{\pi}{8}$ E) $\frac{\pi}{10}$

2. $0 < x < \frac{\pi}{2}$, $\tan x = \sqrt{3} \Rightarrow$ **x = ?**

A) $\frac{\pi}{3}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{6}$ D) $\frac{\pi}{12}$ E) $\frac{\pi}{24}$

3. $\tan x - 1 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{x : x = \frac{\pi}{6} + k\pi \ , \ k \in Z\right\}$

B) $\left\{x : x = \frac{\pi}{3} + k\pi \ , \ k \in Z\right\}$

C) $\left\{x : x = \frac{\pi}{4} + k\pi \ , \ k \in Z\right\}$

D) $\left\{x : x = \frac{2\pi}{3} + k\pi \ , \ k \in Z\right\}$

E) $\{x : x = k\pi \ , \ k \in Z\}$

4. $0 < x \le 2\pi$, $\sin(x + 20^\circ) = \frac{1}{2} \Rightarrow$ **ÇK(SS) = ?**

A) $\{10^\circ\}$ B) $\{130^\circ\}$ C) $\{30^\circ\}$ D) $\{10^\circ, 130^\circ\}$ E) $\{30^\circ, 150^\circ\}$

5. $x \in (0, 2\pi]$,
$\sin(2x + 10^\circ) = 1 \Rightarrow$ **ÇK(SS) = ?**

A) $\{40^\circ\}$ B) $\{220^\circ\}$ C) $\{90^\circ\}$ D) $\{40^\circ, 90^\circ\}$ E) $\{40^\circ, 220^\circ\}$

6. $x \in [0, 2\pi]$,
$\cos x = \frac{\sqrt{2}}{2} \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{\pi}{4}\right\}$ B) $\left\{\frac{\pi}{4}, \frac{3\pi}{4}\right\}$ C) $\left\{\frac{\pi}{4}, \frac{5\pi}{4}\right\}$ D) $\left\{\frac{\pi}{4}, \frac{7\pi}{4}\right\}$ E) $\left\{\frac{7\pi}{4}\right\}$

7. $x \in [0, 90^\circ]$
$\tan(4x - 100^\circ) = \sqrt{3} \Rightarrow \sum x = ?$

A) 115° B) 120° C) 125° D) 130° E) 135°

8. $x \in (0, 270^\circ)$,
$\cot(2x - 40^\circ) = \frac{1}{\sqrt{3}} \Rightarrow$ **ÇK(SS) = ?**

A) $\{60^\circ, 240^\circ\}$ B) $\{60^\circ, 210^\circ\}$ C) $\{50^\circ, 230^\circ\}$ D) $\{50^\circ, 140^\circ\}$ E) $\{50^\circ, 140^\circ, 230^\circ\}$

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9. $x \in (0, \pi)$,

$\sin x \cdot \cos x = \frac{1}{4} \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{\pi}{3}\right\}$ B) $\left\{\frac{\pi}{2}, \frac{2\pi}{3}\right\}$ C) $\left\{\frac{\pi}{12}, \frac{\pi}{3}\right\}$ D) $\left\{\frac{\pi}{12}\right\}$ E) $\left\{\frac{\pi}{12}, \frac{5\pi}{12}\right\}$

10. $0 < x < 90°$,

$\sin(x-25)° = \cos(x+37)° \Rightarrow$ **x = ?**

A) 38° B) 39° C) 40° D) 41° E) 42°

11. $x \in [0, 180°]$,

$\sin 2x = \cos\left(x - \frac{5\pi}{2}\right) \Rightarrow$ **ÇK(SS) = ?**

A) {0°, 60°} B) {60°, 180°} C) {0°, 180°} D) {0°, 60°, 180°} E) {180°}

12. $x \in [0, 2\pi]$,

$\tan\left(2x - \frac{\pi}{4}\right) = \cot\left(\frac{\pi}{6} - x\right) \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{5\pi}{12}\right\}$ B) $\left\{\frac{7\pi}{12}\right\}$ C) $\left\{\frac{13\pi}{12}\right\}$ D) $\left\{\frac{7\pi}{12}, \frac{11\pi}{12}\right\}$ E) $\left\{\frac{7\pi}{12}, \frac{19\pi}{12}\right\}$

13. $x \in [0, 180°]$,

$\cos\frac{5x}{2} = \cos\left(\frac{3x}{2} + 20°\right) \Rightarrow \sum$ **x = ?**

A) 250° B) 280° C) 300° D) 320° E) 360°

14. $\frac{\pi}{2} < x < \pi$,

$\sin x + \frac{1}{\sqrt{3}} \cdot \cos x = 0 \Rightarrow$ **x = ?**

A) $\frac{3\pi}{4}$ B) $\frac{3\pi}{5}$ C) $\frac{2\pi}{3}$ D) $\frac{5\pi}{6}$ E) $\frac{7\pi}{9}$

15. $\frac{\pi}{2} < x < \pi$,

$\cos 5x = \cos x \Rightarrow$ **x = ?**

A) $\frac{3\pi}{4}$ B) $\frac{3\pi}{5}$ C) $\frac{2\pi}{3}$ D) $\frac{5\pi}{6}$ E) $\frac{7\pi}{9}$

16. $\alpha, \beta \in \left(0, \frac{\pi}{2}\right]$,

$\sin(\alpha - \beta) = \sin\alpha \cdot \cos\beta \Rightarrow$ **α = ?**

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{6}$ E) $\frac{\pi}{8}$

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YANITLAR / ANSWERS

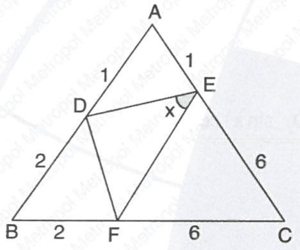
1	2	3	4	5	6	7	8
C	A	C	D	E	D	C	E
9	10	11	12	13	14	15	16
E	B	C	E	B	D	C	A

1. $\arctan a + \arctan b = x$

$\Rightarrow$ **tanx = ?**

A) $\dfrac{a-b}{1+ab}$ B) $\dfrac{1+ab}{a+b}$ C) $\dfrac{a+b}{1-ab}$ D) $\dfrac{1-ab}{a+b}$ E) $\dfrac{1+ab}{a-b}$

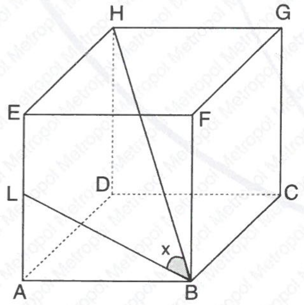
2.



$\Rightarrow$ **x = ?**

A) 120° B) 90° C) 60° D) 45° E) 30°

3.



ABCDEFGH bir küptür.

ABCDEFGH is a cube.

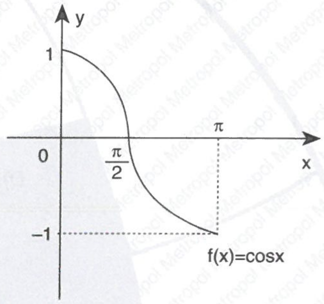
$|EL| = |AL| \Rightarrow$ **tan x = ?**

A) $\sqrt{6}$ B) $\dfrac{\sqrt{6}}{2}$ C) $\dfrac{\sqrt{6}}{3}$ D) $\dfrac{\sqrt{6}}{4}$ E) $\dfrac{\sqrt{6}}{6}$

4. $f(x) = \arcsin\left(\dfrac{x}{3} + 2\right) \Rightarrow$ **$f^{-1}(x) = ?$**

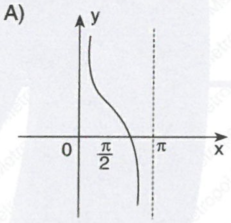
A) 2. sin(x) – 6 B) 2 . sin(x) + 3 C) 3 . sin(x) – 6 D) sin(2x – 6) E) sin(2x) – 3

5.

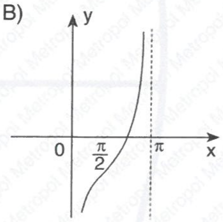


$\Rightarrow$ **f(x) = secx = ?**

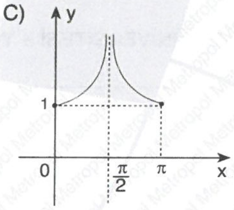
A)



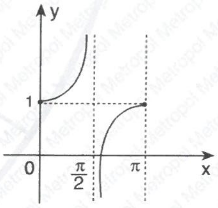
B)



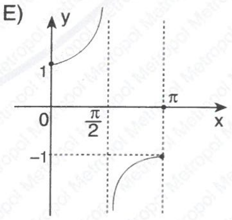
C)



D)



E)



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YANITLAR / ANSWERS

1	2	3	4	5
C	C	C	C	E

1. $0 < x < \pi,\ \cos 4x = \cos 2x$

$\Rightarrow$ **x = ?**

A) $\frac{\pi}{8}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{3}$ E) $\frac{\pi}{2}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

2. $\arccos = \cos^{-1}$

$\cot\left(\arccos\sqrt{\frac{3}{7}}\right) = ?$

A) $\frac{\sqrt{3}}{4}$ B) $\frac{\sqrt{7}}{4}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{4}{3}$ E) 2

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

3. $28x = \pi \Rightarrow \frac{\sin 8x + \sin 6x}{\cos 8x + \cos 6x} = ?$

A) −1 B) 0 C) $\frac{1}{\sqrt{3}}$ D) 1 E) $\sqrt{3}$

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

4. $\tan\left(-\frac{7\pi}{12}\right) = ?$

A) $1+\sqrt{3}$ B) $1-\sqrt{3}$ C) $2+\sqrt{3}$ D) $2-\sqrt{3}$ E) $-\sqrt{3}$

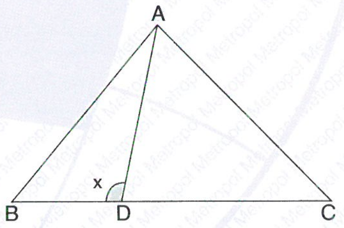
[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

5. $\frac{\sin 2x}{1+\cos 2x} = ?$

A) $\sin x$ B) $\cos x$ C) $2 \cdot \sin x$ D) $\sin x \cdot \cos x$ E) $\tan x$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

6.



$|AC| = |DC| = 5\,br(u)$,

$|AD| = 6\,br(u) \Rightarrow$ **sin x = ?**

A) $-\frac{4}{5}$ B) $-\frac{3}{5}$ C) $\frac{1}{5}$ D) $\frac{3}{5}$ E) $\frac{4}{5}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2014]

YANITLAR / ANSWERS

1	2	3	4	5	6
D	C	D	C	E	E

METROPOL YAYINLARI • METROPOL PUBLICATIONS

BÖLÜM CHAPTER 7

TARİHSEL NOT / HISTORICAL NOTE

RENÉ DESCARTES [1596 - 1650]

Fransız filozof, matematikçi ve yazar. 1637'de René Descartes karesi negatif sayı olan karmaşık sayıların varlığına dikkati çekmiştir. Uzaydaki bir noktayı bir numaralar seti olarak işaretleyebilmeyi ve cebirsel denklemleri iki boyutlu koordinat sisteminde geometrik şekiller olarak göstermeyi (ve tam tersini) sağlayan Kartezyen koordinat sistemi, ismini Descartes'tan alır. Analitik geometrinin de temellerini Descartes atmıştır.

French philosopher, mathematician and writer. In 1637, René Descartes drew attention to the existence of complex numbers whose squares are negative numbers. The Cartesian coordinate system, which can mark a point in space as a set of numbers and display algebraic equations as geometric shapes in the two-dimensional coordinate system, takes its name from Descartes. Descartes also laid the foundations of analytical geometry.

KARMAŞIK SAYILAR
COMPLEX NUMBERS

Bu bölüm 64 alıştırma sorusu, 156 test sorusu, 12 YÖS sorusu içermektedir.

This chapter includes 64 exercise questions, 156 test questions, and 12 YÖS questions.

BÖLÜM / CHAPTER 7

KARMAŞIK SAYILAR / COMPLEX NUMBERS

- Karmaşık Sayılar / Complex Numbers . . . . 183 – 212

BÖLÜM
07
CHAPTER

KARMAŞIK SAYILAR
COMPLEX NUMBERS

1. $i^2 = -1 \Rightarrow \sqrt{-36} + \sqrt{-25} = ?$

Yanıt / The Answer is 11i

2. $i^2 = -1 \Rightarrow \sqrt{-9} \cdot \sqrt{-4} = ?$

Yanıt / The Answer is – 6

3. $i^2 = -1 \Rightarrow i^{36} + i^{13} = ?$

Yanıt / The Answer is 1 + i

4. $i^2 = -1 \Rightarrow i^{-49} + i^{-30} = ?$

Yanıt / The Answer is –i – 1

5. $i^2 = -1,\ n \in Z \Rightarrow i^{4n+3} + i^{12n-1} = ?$

Yanıt / The Answer is – 2i

6. $i^2 = -1,\ n \in Z \Rightarrow i^{-20n+1} + i^{24n+18} = ?$

Yanıt / The Answer is i – 1

7. $i^2 = -1 \Rightarrow i + i^2 + i^3 + \ldots + i^{37} = ?$

Yanıt / The Answer is i

8. $i^2 = -1 \Rightarrow i^{22} + i^{23} + i^{24} + \ldots + i^{91} = ?$

Yanıt / The Answer is –1–i

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9. $(1+i)^3 \cdot (1-i)^2 = ?$

Yanıt / The Answer is $4+4i$

10. $(1-i)^3 + (1+i)^2 = ?$

Yanıt / The Answer is -2

11. $(1+i)^2 \cdot (1-i)^2 = ?$

Yanıt / The Answer is 4

12. $z_1 = -2+3i,$

$z_2 = 6i,$

$2 \cdot z_1 - z_2 = a + bi \Rightarrow a \cdot b = ?$

Yanıt / The Answer is 0

13. $i^2 = -1,$

$$\begin{array}{r|l} x^6 + x^3 + x^2 + 1 & x+i \\ - & \\ \hline k & \end{array}$$

$\Rightarrow k = ?$

Yanıt / The Answer is $i-1$

14. $\frac{1}{1+i} + \frac{2}{i} = ?$

Yanıt / The Answer is $\frac{1-5i}{2}$

15. $\frac{(1+i)^8}{(1-i)^7} = ?$

Yanıt / The Answer is $1-i$

16. $(1-i)^4 + (1+i)^4 = ?$

Yanıt / The Answer is -8

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17. $z = \frac{1}{1+i} - \frac{2i}{1-i}$

$\Rightarrow$ **Re(z) = ?**

Yanıt / The Answer is $\frac{3}{2}$

18. $z = \frac{1-i}{3+i} + \frac{1}{3-i}$

$\Rightarrow$ **Im(z) = ?**

Yanıt / The Answer is $-\frac{3}{10}$

19. $z = \frac{1}{3-4i} + \frac{1}{3+4i}$ $\Rightarrow$ **Re(z) + Im(z) = ?**

Yanıt / The Answer is $\frac{6}{25}$

20. $z = -3i \cdot (1-i) + 2(1+i)^3$

$\Rightarrow$ $\bar{z}$ **= ?**

Yanıt / The Answer is **−7−i**

21. $2 \cdot z + 6 - i = 4i - \bar{z}$

$\Rightarrow$ **z = ?**

Yanıt / The Answer is **−2+5i**

22. $z = 3-2i$ ve (and) $z^{-1} = a + bi$

$\Rightarrow$ **a + b = ?**

Yanıt / The Answer is $\frac{5}{13}$

23. $z = \frac{(1+2i) \cdot (1-i)}{(3-i)}$ $\Rightarrow$ **Re(z) = ?**

Yanıt / The Answer is $\frac{4}{5}$

24. $z_1 = 1 + i,$

$z_2 = 1 - i,$

$z = \frac{\overline{z_1 - z_2}}{z_1 + z_2}$ $\Rightarrow$ **Im(z) = ?**

Yanıt / The Answer is **−1**

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25. $z=(1-i)\cdot(1-2i)\cdot(1-3i) \Rightarrow \mathbf{Re(z)=?}$

Yanıt / The Answer is **−10**

26. $\dfrac{10}{2-i}+\dfrac{10}{2+i}=?$

Yanıt / The Answer is **8**

27. $\left(\dfrac{1+i}{1-i}\right)^3+\left(\dfrac{1-i}{1+i}\right)^3=?$

Yanıt / The Answer is **0**

28. $z=1+\dfrac{1}{\dfrac{1}{1-i}-1} \Rightarrow z^{-1}=?$

Yanıt / The Answer is **i**

29. $\left|\dfrac{(3+4i)\cdot(5-12i)}{-6-8i}\right|=?$

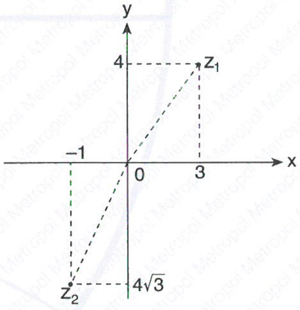
Yanıt / The Answer is $\dfrac{13}{2}$

30. $(2-i)\cdot\overline{z}=z-4i$

$\Rightarrow |z|=?$

Yanıt / The Answer is $\sqrt{2}$

31. $|z_1|+|z_2|=?$



Yanıt / The Answer is **12**

32. $|i^{99}+i^{98}+i^{97}+...+i|=?$

Yanıt / The Answer is **−1**

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33. $z_1 = -2 + i, \; z_2 = 3 - 11i$

$\Rightarrow |z_1 - z_2| = ?$

Yanıt / The Answer is 13

34. $z = 1 - i$

$\Rightarrow \dfrac{|z + i| \cdot |z - i|}{|z \cdot \sqrt{2} \cdot i|} = ?$

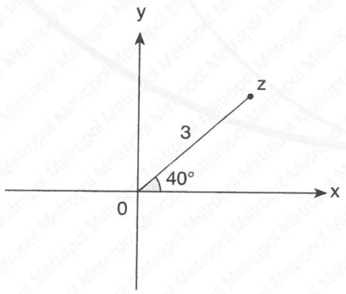
Yanıt / The Answer is $\dfrac{\sqrt{5}}{2}$

35. $z + |z| = 3 + i\sqrt{3}$

$\Rightarrow z = ?$

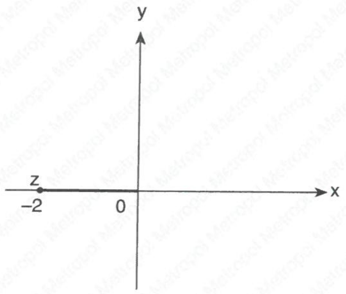
Yanıt / The Answer is $1 + \sqrt{3} \cdot i$

36. $z = ?$



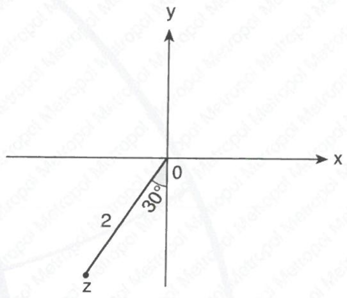
Yanıt / The Answer is $z = 3 \cdot \text{cis}\, 40^\circ$

37. $z = ?$



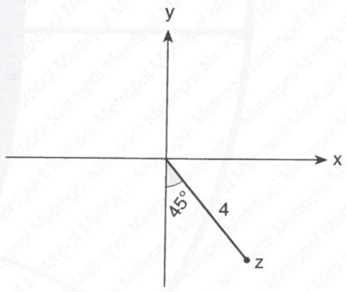
Yanıt / The Answer is $z = 2 \cdot \text{cis}\, 180^\circ$

38. $z = ?$



Yanıt / The Answer is $z = 2 \cdot \text{cis}\, 240^\circ$

39. $z = ?$



Yanıt / The Answer is $z = 4 \cdot \text{cis}\, 315^\circ$

40. $z = -2i, \; z = r \cdot \text{cis}\, \alpha \Rightarrow z = ?$

Yanıt / The Answer is $2 \cdot \text{cis}\dfrac{3\pi}{2}$

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41. $z=-4,\ z=r\cdot cis\,\alpha \Rightarrow$ **z = ?**

Yanıt / The Answer is 4·cis (180°)

42. $z=3+3i,\ z=r\cdot cis\,\alpha \Rightarrow$ **z = ?**

Yanıt / The Answer is $3\sqrt{2}\cdot cis\frac{\pi}{4}$

43. $z=-3-3\sqrt{3}i,\ z=r\,cis\,\alpha \Rightarrow$ **z = ?**

Yanıt / The Answer is $6\cdot cis\,240^\circ$

44. $z=-1-i \Rightarrow$ **Arg(z) = ?**

Yanıt / The Answer is $\frac{5\pi}{4}$

45. $z=1-\sqrt{3}i \Rightarrow$ $\mathbf{z^2 = ?}$

Yanıt / The Answer is $4\cdot cis\,240^\circ$

46. $z=1+i \Rightarrow$ $\mathbf{z^6 = ?}$

Yanıt / The Answer is –8i

47. $z=4\cdot(\cos 36^\circ + i\cdot \sin 36^\circ) \Rightarrow$ $\mathbf{z^5 = ?}$

Yanıt / The Answer is -2^{10}

48. $z_1=4\cdot cis\,30^\circ$,

$z_2=8\cdot cis\,60^\circ \Rightarrow$ $\mathbf{z_1\cdot z_2 = ?}$

Yanıt / The Answer is 32i

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49. $z_1 = 6 \cdot \text{cis}\,10°$,

$z_2 = 9 \cdot \text{cis}\,40° \Rightarrow \mathbf{Arg}\left(\dfrac{z_1^{\,4}}{z_2^{\,3}}\right) = ?$

Yanıt / The Answer is **280°**

---

53. $z_1 = 8(\cos 38° + i\sin 38°)$,

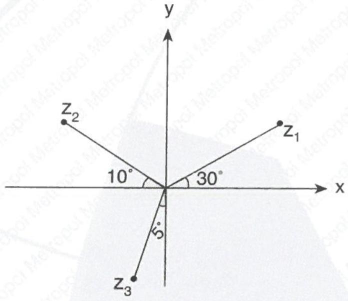
$z_2 = 2(\cos 8° + i\sin 8°)$

$\Rightarrow \dfrac{z_1}{z_2} = ?$

Yanıt / The Answer is $2\sqrt{3} + 2i$

---

50. $\mathbf{Arg(z_1 \cdot z_2 \cdot z_3) = ?}$



Yanıt / The Answer is **105°**

---

54. $z_1 = 3\sqrt{2}\ \text{cis}\dfrac{3\pi}{4}$,

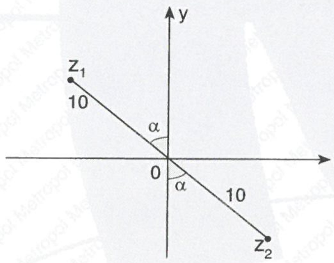
$z_2 = 2 \cdot \text{cis}\dfrac{\pi}{3}$

$\Rightarrow \dfrac{z_1^{\,2}}{z_2^{\,3}} = ?$

Yanıt / The Answer is $\dfrac{9}{4}i$

---

51. $\dfrac{z_1}{z_2} = ?$



Yanıt / The Answer is **–1**

---

55. $a, b \in R^+$, $z = 3 + 4i$

$\sqrt{z} = a + bi \Rightarrow \mathbf{a + b = ?}$

Yanıt / The Answer is **3**

---

52. $(1 + \sqrt{3}i)^8 \cdot (-\sqrt{2} + \sqrt{2}i)^4 = ?$

Yanıt / The Answer is $2^{11}(1 - \sqrt{3}i)$

---

56. $z = \dfrac{2}{1-i} \Rightarrow \mathbf{Arg(z) = ?}$

Yanıt / The Answer is **45°**

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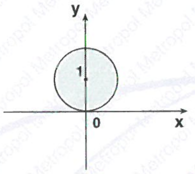
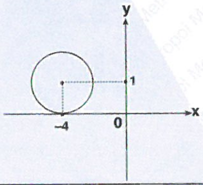
57. $|z-i| \leq 1 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is**



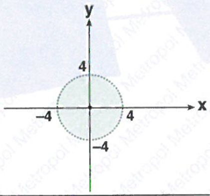
58 . $|z+4-i| = 1 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is**



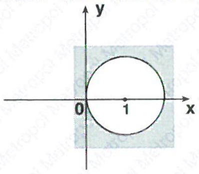
59. $|z| < 4 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is**



60. $|z-1| \geq 1 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is**



61. $|z| \leq 2 \Rightarrow$ **min$(|z-3+4i|)$ = ?**

Yanıt / **The Answer is** **3**

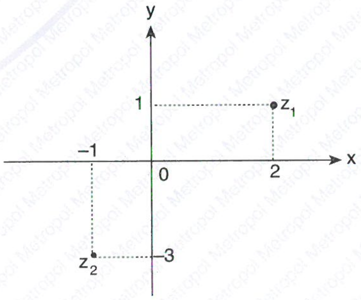
62. $|z| \leq 2 \Rightarrow$ **max$(|z-3+4i|)$ = ?**

Yanıt / **The Answer is** **7**

63. $|z| \leq 4 \Rightarrow$ **max$|z-4+3i|$ = ?**

Yanıt / **The Answer is** **9**

64. $|z_1 \cdot z_2|$ **= ?**



Yanıt / **The Answer is** **$5\sqrt{2}$**

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1. $\sqrt{-1} \cdot \sqrt{-9} \cdot \sqrt{-16} = ?$

A) –6 B) 6 C) 12i D) –12i E) –6i

2. $\sqrt{-36} \cdot \sqrt{-9} - \sqrt{-16} \cdot \sqrt{-25} = ?$

A) 2 B) 2i C) 4 D) 4i E) 2 + 2i

3. $\sqrt{-7} \cdot \sqrt{-14} \cdot \sqrt{-5} \cdot \sqrt{-15} = ?$

A) $35\sqrt{6}$ B) $-35\sqrt{6}$ C) $35\sqrt{6} \cdot i$ D) $-35\sqrt{6} \cdot i$ E) $-\sqrt{6} \cdot i$

4. $\dfrac{\sqrt{-2} \cdot \sqrt{-5} \cdot \sqrt{-10}}{\sqrt{-50}} = ?$

A) $-2\sqrt{2}i$ B) $-\sqrt{2}i$ C) $-\sqrt{2}$ D) $\sqrt{2}$ E) $\sqrt{2}i$

5. $\sqrt{-9} \cdot \sqrt{-25} \cdot \sqrt{-3} \cdot \sqrt{12} = ?$

A) –90i B) –90 C) 90 D) 90i E) 120i

6. $z = \sqrt{-16} - \sqrt{(-3)^2} \Rightarrow$ **Re(z) – Im(z) = ?**

A) –7 B) –5 C) 3 D) 5 E) 7

7. $i = \sqrt{-1}$,

$x^2 + 4 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {–2i} B) {2i} C) {2 – i} D) {2 + i} E) {–2i, 2i}

8. $i^2 = -1$,

$x^2 - 2x + 4 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{1 + 2\sqrt{3}i\}$ B) $\{1 - 2\sqrt{3}i\}$ C) $\{1 \pm \sqrt{3}i\}$ D) $\{2 \pm \sqrt{3}i\}$ E) $\{2 \pm 2\sqrt{3}i\}$

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9. $z_1 = 4a - 1 + 3i,$

$z_2 = b + (a + 5)i,$

$z_1 = z_2 \Rightarrow$ **a – b = ?**

A) 2 B) 3 C) 5 D) 7 E) 9

10. $z_1 = 7 - m + i,$

$z_2 = 2ni - 5i - 4,$

$z_1 = z_2 \Rightarrow$ **m + n = ?**

A) 11 B) 12 C) 14 D) 16 E) 18

11. $\left.\begin{array}{l} z_1 = 3 - 4i \\ z_2 = 8 + 6i \\ z_3 = a + bi \\ z_3 = z_1 - z_2 \end{array}\right\} \Rightarrow \sqrt{a^2 + b^2} = ?$

A) 10 B) $5\sqrt{5}$ C) $3\sqrt{5}$ D) 5 E) $\sqrt{5}$

12. $i^2 = -1,$

$z_1 = \sqrt{9} \cdot i + xi + \sqrt[3]{-8} + y$

$z_2 = 2y + \sqrt[5]{-32} + \sqrt{-16} \cdot x$

$z_1 = z_2 \Rightarrow$ **x · y = ?**

A) 8 B) 4 C) 0 D) –4 E) –8

13. $f(x) = x^2 + bx + c$

$f(x_1) = f(x_2) = 0$

$x_1 = 3 + i \Rightarrow$ **b · c = ?**

A) 60 B) –60 C) 30 D) 15 E) –30

14. $P(x) = x^2 + bx + c$

$P(x_1) = P(x_2) = 0$

$x_1 = 3 - 2i \Rightarrow$ **P(–1) = ?**

A) 5 B) 10 C) 20 D) 25 E) 30

15. $x^2 + mx - 4 = 0$, $ÇK(SS) = \{x_1, x_2\}$,

$x_1 = 2 + i \Rightarrow$ **m = ?**

A) 4 B) $\frac{-2-9i}{5}$ C) $\frac{-2+9i}{5}$ D) –4 E) $\frac{2+9i}{5}$

16. $x^2 + 4ax - 6 \cdot b - 5i = 0$

$x_1 = 1 + i \Rightarrow$ **x_2 = ?**

A) – i B) 4 + i C) 4 – i D) – 4 + i E) – 4 – i

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1	2	3	4	5	6	7	8
D	A	A	C	A	A	E	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	C	B	C	B	C	B	E

1. $i^{67} = ?$

A) 2i B) i C) 0 D) 1 E) – i

2. $i^{143} + i^{172} = ?$

A) 1 + i B) 2 + i C) 1 – i D) 2 – i E) – i

3. $i^2 = -1 \Rightarrow$
$(1+i^7)\cdot(1+i^{33})\cdot(1+i^{19})\cdot(1+i^{13})\cdot(1+i^{23})\cdot(1+i^{17}) = ?$

A) 2 B) 4 C) 8 D) 16 E) 32

4. $\left(i^{17}+\frac{2}{i^{13}}\right)^4 = ?$

A) – 2 B) – 1 C) 0 D) 1 E) 2

5. $(1+i)^9 \cdot i^{43} = ?$

A) 4 B) $8\cdot(1-i)$ C) $8\cdot(1+i)$ D) $16\cdot(1-i)$ E) $16\cdot(1+i)$

6. $(1+i)^{13} = ?$

A) -2^6 B) $2^6\cdot i$ C) $-2^6\cdot(1+i)$ D) $2^6\cdot(1+i)$ E) $1+i$

7. $(1+i)^{11} - (1-i)^{11} = ?$

A) –64 B) 64 C) 0 D) –64i E) 64i

8. $(1+i)^{16} - (1-i)^{16} = ?$

A) 0 B) 4i C) –4i D) –16 E) 16^2

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9. $(1+i)^{13}+(1-i)^{9}=z \Rightarrow \mathbf{Re(z)=?}$

A) 24 B) –24 C) 48 D) –48 E) 0

10. $\dfrac{(1+i)^9}{(1-i)^5}\cdot(3+2i)=?$

A) $8-12i$ B) $8+12i$ C) $-8-12i$ D) $-8+12i$ E) $-3-2i$

11. $\left(\dfrac{1+i^{49}}{1+i^{51}}\right)^{18}=?$

A) –3i B) –2i C) 2 D) –1 E) 0

12. $z=(8-4\sqrt{3}i)\cdot(2+i) \Rightarrow \mathbf{Im(z)=?}$

A) $8(1-\sqrt{3})$ B) $16(1-\sqrt{3})$ C) $32(1-\sqrt{3})$ D) $64(1-\sqrt{3})$ E) $8(1+\sqrt{3})$

13. $\dfrac{2+i}{1+i}+\dfrac{6}{2-i}=z \Rightarrow \mathbf{Im(z)=?}$

A) $\dfrac{3}{10}$ B) $\dfrac{5}{10}$ C) $\dfrac{7}{10}$ D) $\dfrac{9}{10}$ E) $\dfrac{10}{9}$

14. $z=1+i+\dfrac{2}{1-i} \Rightarrow \mathbf{z^{-1}=?}$

A) $1-i$ B) $1+i$ C) $\dfrac{1-i}{4}$ D) $\dfrac{1+i}{4}$ E) $\dfrac{-1-i}{4}$

15. $(3-4i)\cdot(4+2i)=x+2-3i+yi$

$\Rightarrow \mathbf{x+y=?}$

A) 12 B) 11 C) 10 D) 9 E) 8

16. $6a+12i=4b+ai+16 \Rightarrow \mathbf{z=a+bi=?}$

A) $14+12i$ B) $14-12i$ C) $16+12i$ D) $16-12i$ E) $12+14i$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	C	C	D	D	C	E	A
9	10	11	12	13	14	15	16
D	A	D	A	C	C	B	E

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1. $i^{67} + i^{93} + i^{106} = ?$

A) –1 B) 1 C) i D) –i E) i + 1

2. $i^{905} - i^{2012} - i^{1905} = ?$

A) –1 B) 0 C) 1 D) 2 E) 3

3. $\dfrac{i^{2014} + i^{2013}}{i^{2012} + i^{2011}} = ?$

A) –1 B) –i C) 0 D) 1 E) i

4. $i^2 = -1$, $n \in N$,

$i^{4n+23} + i^{-12n+25} - i^{26-16n} = ?$

A) 1 B) –i C) 0 D) i E) 2i

5. $i + i^2 + i^3 + \ldots + i^{208} = ?$

A) –i B) –1 C) 0 D) 2i E) 1

6. $i^2 = -1$,

$i^{86} + i^{-86} + i^{43} + i^{-43} + i^{50} = ?$

A) i B) –i C) –3 D) 3i E) 3+i

7. $n \in Z \Rightarrow \dfrac{i^{8n-1} + i^{4n}}{i^{4n-1}} = ?$

A) 1 – i B) 1 + i C) –1 – i D) 1 E) 2

8. $i^2 = -1$,

$(1 + i)^5 + (1 - i)^5 = ?$

A) –8 B) –5 C) 0 D) 5 E) 8

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9. $i^2 = -1,$

$\left(\frac{1+i}{1-i}\right)^{20} = ?$

A) –2i B) –i C) –1 D) 1 E) 2i

10. $\left(\frac{1+i}{1-i}\right)^{1917} = ?$

A) 1 B) i C) 0 D) –1 E) –i

11. $\frac{(1+i)^{87}}{(1-i)^{86}} = ?$

A) $-1-i$ B) $-5i$ C) -5 D) -2 E) $-2i$

12. $\frac{(3+i^3)\cdot(3+i^5)}{(i^9-2)\cdot(i^{13}+2)} = ?$

A) 5i B) – 5i C) –5 D) – 2 E) –2i

13. $(2-i)\cdot(2-i^3)\cdot(2-i^{12})\cdot(2-i^{15})\cdot(2-i^{17}) = ?$

A) 50 B) 50i C) 25 D) 25i E) –25

14. $P(x) = x^{35} + 2x^{33} + 5x^{31}$

$\Rightarrow P(i) = ?$

A) 4i B) –4i C) 2i D) –2i E) –2i+4

15. $f(x) = -x^{15} + 3x^{11} - 2x^7 - 3x^5 + 2$

$\Rightarrow f(-i) = ?$

A) $2-3i$ B) $2-2i$ C) $2-i$ D) $2+2i$ E) $2+3i$

16. $i^2 = -1,$

$i^2 + 2i^5 + 3i^8 + ... + k\cdot i^{3k-1} + ... + 64\cdot i^{191} = ?$

A) $16-16i$ B) $16+16i$ C) $32-32i$ D) $32+32i$ E) $64-64i$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	A	A	A	C	C	B	A
9	10	11	12	13	14	15	16
D	B	A	D	C	B	E	C

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1. $\dfrac{\sqrt{(-2)^2}+\sqrt{-1}+\sqrt{(-3)^2}-\sqrt{-9}}{1+i} = ?$

A) $\frac{1}{2}+\frac{3}{2}i$ B) $\frac{1}{2}-\frac{3}{2}i$ C) $\frac{3}{2}-\frac{5}{2}i$ D) $\frac{3}{2}-\frac{7}{2}i$ E) $\frac{3}{2}+\frac{7}{2}i$

2. $\dfrac{i^{21}+2i^{43}-i^{124}}{2+i} = ?$

A) $-3-i$ B) $-3+i$ C) $\frac{3+i}{5}$ D) $\frac{-3-i}{5}$ E) $-3-i$

3. $z=(1+i)^5\cdot(1-i)^6 \Rightarrow$ **Re(z) = ?**

A) 4 B) 8 C) – 8 D) 32 E) – 32

4. $z=\dfrac{(1+i)^{43}}{(1-i)^{41}} = ?$

A) –6 B) –5 C) – 3 D) – 2 E) 0

5. $\dfrac{(1+i)^6-(1-i)^6}{(1-i)^3\cdot(1+i)^3} = ?$

A) -2^4 B) $-2^3\cdot i$ C) $-2^2\cdot i$ D) $-2i$ E) -2

6. $(1-i)^6+(1+i)^8=a+bi \Rightarrow$ **a – b = ?**

A) –8 B) 8 C) 0 D) 16 E) –16

7. $(1-i)^{28}+(1+i)^{28} = ?$

A) 2^{28} B) $-2^{28}\cdot i$ C) $2^{15}\cdot i$ D) -2^{15} E) 2^{15}

8. $z=\dfrac{i^{15}\cdot(1+i)^5}{(1-i)\cdot(1+i^{17})-1} = ?$

A) $4i$ B) $-4i$ C) $-4+4i$ D) $-4-4i$ E) $-16i$

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9. $\dfrac{5}{(1-i)\cdot(2-i)\cdot(3-i)}=?$

A) $-\frac{1}{2}$ B) $-\frac{i}{2}$ C) $\frac{3i}{2}$ D) $-\frac{3i}{2}$ E) $\frac{i}{2}$

10. $z=2-3i \Rightarrow \frac{1}{z}=?$

A) $\frac{2}{13}+\frac{3}{13}i$ B) $\frac{2}{13}-\frac{3}{13}i$ C) $-\frac{2}{13}-\frac{3}{13}i$ D) $-\frac{2}{13}+\frac{3}{13}i$ E) $\frac{4}{13}+\frac{9}{13}i$

11. $z=\frac{4}{1-2i}+\frac{1}{2-i} \Rightarrow \text{Im}(z)=?$

A) $-\frac{5}{9}$ B) $\frac{5}{9}$ C) -9 D) $-\frac{9}{5}$ E) $\frac{9}{5}$

12. $a+bi=\frac{i}{2-i}-\frac{1-2i}{1+i} \Rightarrow a+b=?$

A) $\frac{11}{5}$ B) 2 C) $\frac{9}{5}$ D) $\frac{8}{5}$ E) $\frac{7}{5}$

13. $z\in\mathbb{C}$,

$\frac{z-2}{2-i}=\frac{4}{1+i} \Rightarrow \text{Im}(z)=?$

A) -12 B) -6 C) 0 D) 6 E) 12

14. $i\cdot z-\frac{5}{4-3i}=0 \Rightarrow z=?$

A) $3-4i$ B) $3+4i$ C) $\frac{3-4i}{5}$ D) $\frac{3+4i}{5}$ E) $\frac{-3-4i}{5}$

15. $z\cdot\bar{z}+i\cdot z=6+2i \Rightarrow \sum z=?$

A) $-i$ B) i C) $4i$ D) $-4i$ E) $4+i$

16. $z+\bar{z}=14$,

$z\cdot\bar{z}=625 \Rightarrow z=?$

A) $7-24i$ B) $7+24i$ C) $8+15i$ D) $8-15i$ E) $-7-24i$

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1	2	3	4	5	6	7	8
D	D	D	D	D	B	D	C
9	10	11	12	13	14	15	16
E	A	E	A	B	C	E	B

1. $\dfrac{(1-i^2)\cdot(1-i^6)\cdot(1-i^{10})}{(1-i)\cdot(1-i^3)\cdot(1-i^5)} = ?$

A) $1+2i$ B) $2-2i$ C) $1-2i$ D) $2+2i$ E) $-2i$

2. $(1+i)^4\cdot\left(2-\dfrac{2}{i}\right)^2 = ?$

A) 4i B) 32i C) –32i D) –4i E) 16

3. $\left.\begin{array}{l} z_1 = 3+i \\ z_2 = 3-i \end{array}\right\} \Rightarrow \text{Re}\left(\dfrac{z_1+z_2}{z_1}\right) = ?$

A) $\frac{9}{5}$ B) $\frac{3}{5}$ C) 0 D) $-\frac{3}{5}$ E) $-\frac{9}{5}$

4. $z = \dfrac{1}{1+i} + \dfrac{1}{1-i} \Rightarrow \text{Im}(z) = ?$

A) 4 B) 3 C) 2 D) 1 E) 0

5. $z = \dfrac{4-3i}{1+i} \Rightarrow \text{Re}(z) = ?$

A) $-\frac{1}{7}$ B) $-\frac{1}{4}$ C) $\frac{1}{2}$ D) $\frac{1}{4}$ E) $\frac{2}{7}$

6. $z\cdot(1-i) = 5-i \Rightarrow z = ?$

A) 5i B) $3-2i$ C) $3+2i$ D) $-5i$ E) $-3-2i$

7. $(z+1)\cdot(2+i) = 3-2i \Rightarrow \text{Re}(z) + \text{Im}(z) = ?$

A) $-\frac{8}{5}$ B) $-\frac{3}{5}$ C) $\frac{1}{5}$ D) $\frac{3}{5}$ E) $\frac{8}{5}$

8. $a+bi+\dfrac{1}{1+i} = 1-i \Rightarrow a+b = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

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9. $i^2 = -1$,

$z = \dfrac{i}{(1-i)\cdot(2+i)} \Rightarrow \mathbf{Im(z) = ?}$

A) $-\dfrac{1}{10}$ B) $-\dfrac{3}{10}$ C) $\dfrac{1}{10}$ D) $\dfrac{3}{10}$ E) $-\dfrac{1}{2}$

10. $z = -3 + 4i \Rightarrow \mathbf{Re(z^{-1}) = ?}$

A) $-\dfrac{3}{4}$ B) $-\dfrac{4}{25}$ C) $-\dfrac{3}{25}$ D) $\dfrac{4}{25}$ E) $\dfrac{\sqrt{3}}{5}$

11. $(2-i)\cdot z = 1 - \bar{z} \Rightarrow \mathbf{Re(z) = ?}$

A) 1 B) $\dfrac{1}{2}$ C) $\dfrac{1}{4}$ D) $-\dfrac{1}{2}$ E) $-\dfrac{1}{4}$

12. $(2-3i)\cdot z + \bar{z} = 12 \Rightarrow \mathbf{Im(z) = ?}$

A) – 3 B) – 2 C) – 1 D) 2 E) 3

13. $z = \dfrac{1}{4-3i} \Rightarrow \mathbf{Im(\bar{z}) = ?}$

A) 3i B) $\dfrac{3}{25}$ C) $-3i$ D) $\dfrac{-3}{25}$ E) – 3

14. $4z - 3\bar{z} = \dfrac{1-18i}{2-i} \Rightarrow \mathbf{z = ?}$

A) $-4+i$ B) $-4-i$ C) $-2+i$

D) $3-2i$ E) $4-i$

15. $z_1 = 2 + 2\sqrt{3}i$,

$z_2 = 1 - \sqrt{3}i$

$\Rightarrow \mathbf{(z_1 + \bar{z}_2)\cdot(z_2 + \bar{z}_1) = ?}$

A) 9 B) 18 C) 27 D) 36 E) 81

16. $f, g: \mathbb{C} \to \mathbb{C}$, $z \in \mathbb{C}$,

$\left.\begin{array}{l} f(z) = \bar{z} - z \\ g(z) = z\cdot\bar{z} \end{array}\right\} \Rightarrow \mathbf{(gof)(3-i) = ?}$

A) –4 B) 4 C) 4i D) –4i E) –1

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1	2	3	4	5	6	7	8
D	C	A	E	C	C	A	A
9	10	11	12	13	14	15	16
D	C	C	E	D	E	D	B

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1. $z = \frac{4}{1+\sqrt{3}\cdot i} + \frac{\sqrt{3}+i}{\sqrt{3}-i} \Rightarrow \mathbf{Re(z) = ?}$

A) 2 B) 1 C) $\frac{1}{2}$ D) $\frac{3}{2}$ E) $\frac{5}{2}$

2. $z = \frac{10}{2+i} + \frac{4}{1-i} + \frac{3}{i}$

$\Rightarrow \mathbf{Im(z) + Re(z) = ?}$

A) $17-i$ B) $17+i$ C) $-3i$ D) $6+3i$ E) $6-3i$

3. $-2+\bar{z} = (2-i)\cdot z + 2 \Rightarrow \mathbf{z = ?}$

A) $-1-i$ B) $-1+i$ C) $1+i$ D) $-3-i$ E) $3+i$

4. $2z + \bar{z}\cdot i = 4+5i \Rightarrow \mathbf{z = ?}$

A) $1-2i$ B) $1+2i$ C) $2-2i$ D) $2+2i$ E) $-2i+5$

5. $\left|\frac{(3-\sqrt{5}\cdot i)\cdot(\sqrt{3}+i)^2}{\sqrt{13}+i}\right| = ?$

A) 13 B) 9 C) 5 D) 4 E) 1

6. $z = \frac{(-\sqrt{3}+i)\cdot(2-2i)^2}{2\sqrt{3}-2i} \Rightarrow \mathbf{|z| = ?}$

A) 16 B) 4 C) 1 D) $\frac{1}{4}$ E) $\frac{1}{16}$

7. $z = \frac{(3+4i)\cdot 3i}{2-i} \Rightarrow \mathbf{|z| = ?}$

A) $12\sqrt{5}$ B) $9\sqrt{5}$ C) $3\sqrt{5}$ D) $-9\sqrt{5}$ E) $-12\sqrt{5}$

8. $\left.\begin{array}{l} z_1 = 2\sqrt{3}-2i \\ z_2 = 1+\sqrt{3}i \end{array}\right\} \Rightarrow \left|\frac{z_1}{z_2}\right| = ?$

A) 0 B) 1 C) 2 D) 4 E) 16

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9. $z = \frac{2-3i}{1+i} \Rightarrow |\bar{z}| = ?$

A) $\sqrt{13}$ B) $\sqrt{26}$ C) $\frac{\sqrt{13}}{2}$ D) $\frac{\sqrt{26}}{2}$ E) $\frac{\sqrt{26}}{4}$

10. $z + |z| = 9 - 3i \Rightarrow \mathrm{Re}(z) = ?$

A) 1 B) 4 C) 7 D) 10 E) 13

11. $z - 1 = |z| - 2i \Rightarrow \mathrm{Im}(z) = ?$

A) – 5 B) – 2 C) 0 D) 2 E) 7

12. $|z| + i \cdot z = 2 + 4i \Rightarrow z = ?$

A) $4-3i$ B) $4+3i$ C) $-4-3i$ D) $-3i$ E) $4i$

13. $3z - 4i = (2-i) \cdot \bar{z} \Rightarrow |\bar{z}| = ?$

A) $\sqrt{5}$ B) $\sqrt{3}$ C) $\sqrt{2}$ D) 1 E) 0

14. $(2-i) \cdot z = (3-2i) \cdot \bar{z} + 16i \Rightarrow |z| = ?$

A) $4\sqrt{10}$ B) $2\sqrt{10}$ C) $\sqrt{10}$ D) $\sqrt{5}$ E) $\frac{\sqrt{5}}{2}$

15. $z = a + bi,$

$4 \cdot z - 7 = 5 - 4\sqrt{3} \cdot i \Rightarrow |z| = ?$

A) $2\sqrt{3}$ B) $4\sqrt{3}$ C) $8\sqrt{3}$ D) $16\sqrt{3}$ E) $32\sqrt{3}$

16. $z = 1 + 2i \Rightarrow z^3 = ?$

A) $-11+2i$ B) $-11-2i$ C) $11+2i$ D) $11-2i$ E) $1-2i$

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1	2	3	4	5	6	7	8
D	E	D	B	D	B	C	C
9	10	11	12	13	14	15	16
D	B	B	A	C	B	A	B

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1. $i \cdot z + 1 = 2 \cdot (1 - z) \Rightarrow$ **Re(z) = ?**

A) 3 B) 2 C) 1 D) $\frac{2}{3}$ E) $\frac{3}{2}$

2. $z = x + yi$,
$(1 - 2i) \cdot z = -4 - 6i + \bar{z} \Rightarrow$ **Re(z) = ?**

A) −2 B) −1 C) 0 D) 1 E) 2

3. $z + 3 - 2i = (1 + i) \cdot \bar{z}$
$\Rightarrow$ **|z| = ?**

A) 5 B) 6 C) 8 D) 10 E) 25

4. $|z| + z = 3 - 2i \Rightarrow$ **Re(z) = ?**

A) 5 B) $\frac{5}{6}$ C) $\frac{6}{5}$ D) −5 E) 10

5. $z = \frac{1 + 3i}{1 - 3i} \Rightarrow$ **|z| = ?**

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 3

6. $z = \frac{(1 + 3i) \cdot (2 - i)}{(1 + 2i)} \Rightarrow$ **|z| = ?**

A) $\frac{\sqrt{5}}{2}$ B) $\frac{\sqrt{10}}{2}$ C) $\sqrt{2}$ D) $\sqrt{5}$ E) $\sqrt{10}$

7. $z = \frac{(\sqrt{5} - 2i) \cdot (4 - 2i)}{2 + i} \Rightarrow$ **|z| = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

8. $z = 2 - 3i \Rightarrow$ **$|z^{-1}|$ = ?**

A) $\frac{\sqrt{13}}{13}$ B) $\frac{\sqrt{13}}{11}$ C) $\sqrt{13}$ D) 13 E) 26

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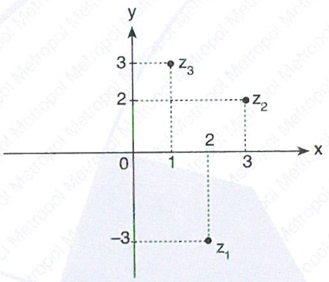
9. $\left.\begin{array}{l} z_1 = 3 + 4i \\ z_2 = 5 - 12i \end{array}\right\} \Rightarrow |z_1 \cdot z_2| = ?$

A) 45 B) 50 C) 55 D) 60 E) 65

10. $\dfrac{|z_1 \cdot z_3|}{|z_2|} = ?$



A) $\dfrac{\sqrt{3}}{5}$ B) $\dfrac{3\sqrt{3}}{5}$ C) $\dfrac{\sqrt{5}}{3}$ D) $\dfrac{3\sqrt{10}}{5}$ E) $\sqrt{10}$

11. $\left.\begin{array}{l} z_1 = -1 + 3i \\ z_2 = 1 + 2i \end{array}\right\} \Rightarrow |z_1 - z_2| = ?$

A) $\sqrt{5}$ B) $2\sqrt{5}$ C) $3\sqrt{5}$ D) $4\sqrt{5}$ E) $5\sqrt{5}$

12. $\left.\begin{array}{l} z_1 = 8 - 6i \\ z_2 = 1 + i \end{array}\right\} \Rightarrow |z_1 - 2 \cdot z_2| = ?$

A) $\sqrt{2}$ B) $5\sqrt{2}$ C) $5\sqrt{5}$ D) $\sqrt{10}$ E) 10

13. $b \in R^-$,

$z = a + bi$,

$z \cdot \bar{z} - 4ai = 5 + 8i \Rightarrow \mathrm{Re}(z) + \mathrm{Im}(z) = ?$

A) −4 B) −3 C) −2 D) 2 E) 3

14. $z \in \mathbb{C}$, $z = x + iy$,

$z \cdot \bar{z} - \sqrt{z \cdot \bar{z}} = 42$

$\Rightarrow x^2 + y^2 = ?$

A) 16 B) 25 C) 36 D) 49 E) 64

15. $z = a + bi$,

$3i \cdot z + 2 = \dfrac{\bar{z}}{i} + 4i \Rightarrow z = ?$

A) $1 + i$ B) $1 - i$ C) $-1 - i$ D) $2i$ E) $-2i$

16. $\left.\begin{array}{l} z_1 = 2 - 2\sqrt{3}\,i \\ z_2 = 1 + i \end{array}\right\} \Rightarrow |z_1^5 \cdot z_2^{-8}| = ?$

A) 128 B) 64 C) 32 D) 16 E) 8

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	D	A	B	C	E	E	A
9	10	11	12	13	14	15	16
E	E	A	E	B	D	A	B

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1. $x \neq 0,\ z = x + yi,$

$z + 4 = |z| - 2i \Rightarrow$ **$x + y = ?$**

A) $-\frac{9}{2}$ B) $-\frac{7}{2}$ C) 0 D) –1 E) 2

2. $z = |z - 2| - 2i \Rightarrow$ **$z = ?$**

A) $2 + 3i$ B) $3 - 2i$ C) $2 + 2i$ D) $2 - 2i$ E) $3 + i$

3. $z = \dfrac{1+ix}{1-ix} \Rightarrow$ **$|z| = ?$**

A) 4 B) 2 C) 1 D) $\frac{2}{3}$ E) $\frac{1}{3}$

4. $z = \dfrac{(-1+2i)^3 \cdot \sqrt{4-3i}}{(2-i)^4} \Rightarrow |\bar{z}| = ?$

A) $\frac{\sqrt{5}}{5}$ B) $\frac{1}{2}$ C) 1 D) 2 E) $\sqrt{5}$

5. $z_1 = 3 - 4i$, $z_2 = \sqrt{7} - \sqrt{2}i$, $z_3 = -6 + 8i$ $\Rightarrow \left|\dfrac{z_1^2 \cdot z_2}{z_3}\right| = ?$

A) $\frac{15}{2}$ B) $\frac{13}{2}$ C) 13 D) 15 E) 18

6. $z = \dfrac{(3-i)\cdot(-3+4i)}{(1-i)} \Rightarrow |(z)^2| = ?$

A) 10 B) 25 C) 75 D) 100 E) 125

7. $z_1 = 1 - \sqrt{5}i$, $z_2 = \sqrt{13}i + \sqrt{14}$, $z_3 = 4 - \sqrt{2}\cdot i$ $\Rightarrow \left|\dfrac{z_1 \cdot z_2}{z_3}\right| = ?$

A) 1 B) 2 C) 3 D) 4 E) 6

8. $z_1 = 4 + 5i,$

$z_2 = 7 + i \Rightarrow$ **$|z_1 - z_2| = ?$**

A) 5 B) 6 C) 7 D) 8 E) 9

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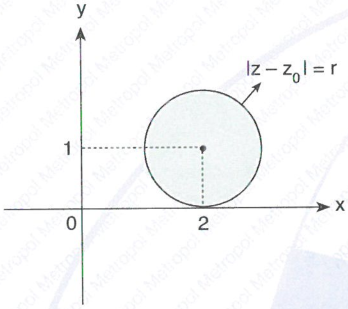
9. $a \in R^+$,

$z_1 = 3 - ia,\ \ z_2 = a + 2i,$

$|z_1 - z_2| = \sqrt{17} \Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

10.



A) $|z - 1 - 2i| \le 1$

B) $|z + 1 + 2i| \le 1$

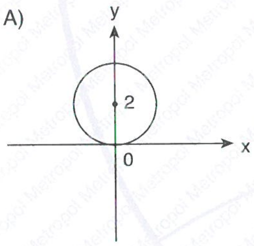
C) $|z - 2 - i| \le 1$

D) $|z + 2 + i| \le 2$

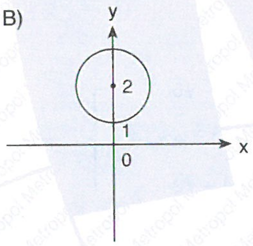
E) $|z - 2 - i| \le 2$

11. $|z - 2i| = 1 \Rightarrow$ **ÇK(SS) = ?**

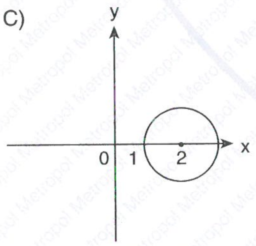
A)



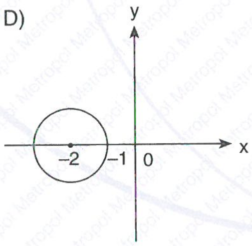
B)



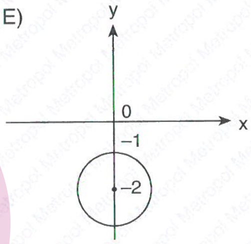
C)



D)



E)



12. $|z| \le 1$,

$A = |z - 3 + 4i| \Rightarrow$ **max(A) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

13. $|z| \le 3 \Rightarrow$ **$\min(|z + 4|) = ?$**

A) – 1 B) 0 C) 1 D) 2 E) 3

14. $z \cdot |Re(z)| = -4 + 3i \Rightarrow$ **$|z| = ?$**

A) $\frac{5}{2}$ B) 7 C) 6 D) 3 E) 1

15. $a > 0$,

$z = a + (a + 2)i,$

$|\bar{z} + i - 1| = 10 \Rightarrow$ **a = ?**

A) 6 B) 8 C) 7 D) 9 E) 3

16. $\left.\begin{array}{l} z_1 = 3 \cdot cis13^\circ \\ z_2 = 4 \cdot cis103^\circ \end{array}\right\} \Rightarrow$ **$|z_1 - z_2| = ?$**

A) 20 B) 15 C) 10 D) 5 E) 1

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	D	C	C	A	E	C	A
9	10	11	12	13	14	15	16
B	C	B	C	C	A	C	D

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1. $z = 2 + \sqrt{3}i \Rightarrow \mathbf{Im(z^2) = ?}$

A) $4\sqrt{3}$ B) $2\sqrt{3}$ C) 1 D) $-\sqrt{3}$ E) $-4\sqrt{3}$

2. $i^2 = -1,$

$z = \dfrac{i^3 + i^{11}}{1 - i} \Rightarrow \mathbf{z^{14} = ?}$

A) 2^7 B) -2^7 C) $-2^7.i$ D) $-2^6.i$ E) $2^7.i$

3. $\left(\dfrac{4-3i}{3+4i}\right)^{49} + \left(\dfrac{2+7i}{7-2i}\right)^{63} = ?$

A) 2i B) i C) 0 D) – i E) –2i

4. $z = i + \sqrt{3} \Rightarrow \mathbf{z = r \cdot cis\theta = ?}$

A) $\sqrt{2} \cdot cis\frac{\pi}{6}$ B) $\sqrt{2} \cdot cis\frac{\pi}{3}$ C) $\sqrt{2} \cdot cis\frac{\pi}{4}$ D) $2 \cdot cis\frac{\pi}{6}$ E) $2 \cdot cis\frac{\pi}{8}$

5. $z = -3 + 3i \Rightarrow \mathbf{z = ?}$

A) $3 \cdot cis\frac{\pi}{4}$ B) $\sqrt{2} \cdot cis\frac{3\pi}{4}$ C) $3\sqrt{2} \cdot cis\frac{3\pi}{4}$ D) $3\sqrt{2} \cdot cis\frac{\pi}{4}$ E) $3\sqrt{2} \cdot cis\frac{\pi}{2}$

6. $z = 1 + i\sqrt{3} \Rightarrow \mathbf{z = r \cdot cis\theta = ?}$

A) $2 \cdot cis\frac{\pi}{6}$ B) $2 \cdot cis\frac{\pi}{3}$ C) $4 \cdot cis\frac{\pi}{6}$ D) $4 \cdot cis\frac{\pi}{3}$ E) $2 \cdot cis\frac{\pi}{2}$

7. $z = 2 - 2i,\ z = r \cdot cis\theta \Rightarrow \mathbf{z = ?}$

A) $2\sqrt{2} \cdot cis\frac{\pi}{4}$ B) $2\sqrt{2} \cdot cis\frac{3\pi}{4}$ C) $2\sqrt{2} \cdot cis\frac{5\pi}{4}$ D) $2\sqrt{2} \cdot cis\frac{7\pi}{4}$ E) $\sqrt{2} \cdot cis\frac{5\pi}{2}$

8. $z = -3 + \sqrt{3}i,\ z = r \cdot cis\theta \Rightarrow \mathbf{z = ?}$

A) $2\sqrt{3} \cdot cis30°$ B) $2\sqrt{3} \cdot cis120°$ C) $2\sqrt{3} \cdot cis150°$ D) $2\sqrt{3} \cdot cis210°$ E) $2\sqrt{3} \cdot cis240°$

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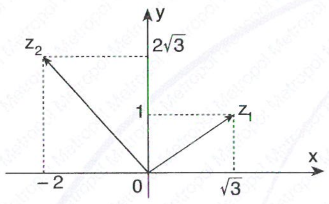
9. $\frac{1}{z} = \cos\frac{\pi}{4} + i \cdot \sin\frac{\pi}{4} \Rightarrow$ **z = ?**

A) $\sqrt{2}\cdot(1+i)$ B) $\sqrt{2}\cdot(1-i)$ C) $\frac{\sqrt{2}}{2}\cdot(1+i)$

D) $\frac{\sqrt{2}}{2}\cdot(1-i)$ E) $\frac{1+i}{2}$

10.



$\Rightarrow$ $\mathbf{z_1 \cdot z_2 = ?}$

A) $2^2\cdot(-\sqrt{3}+i)$ B) $2^3\cdot(-\sqrt{3}+i)$ C) $2^2\cdot(-\sqrt{3}-i)$

D) $2^3\cdot(-\sqrt{3}-i)$ E) $2^4\cdot i$

11. $\left.\begin{aligned} z_1 &= \text{cis}\,160° \\ z_2 &= \text{cis}\,100° \\ z_3 &= \text{cis}\,200° \end{aligned}\right\} \Rightarrow \mathbf{\frac{z_1 \cdot z_2}{z_3} = ?}$

A) $\frac{1}{2}+\frac{\sqrt{3}}{2}i$ B) $\frac{1}{2}-\frac{\sqrt{3}}{2}i$

C) $\frac{\sqrt{3}}{2}-\frac{1}{2}i$ D) $\frac{\sqrt{3}}{2}-\frac{1}{2}i$

E) $1+i$

12. $z_1 = \cos 40° - i\cdot\sin 40°$

$z_2 = \cos 160° + i\cdot\sin 160°$

$\Rightarrow$ $\mathbf{arg(z_1^2 \cdot z_2) = ?}$

A) 20° B) 40° C) 60° D) 80° E) 100°

13. $z = 2\cdot\text{cis}\frac{\pi}{3} \Rightarrow$ $\mathbf{z^6 = ?}$

A) –64 B) 64i C) –2 + 2i

D) 2 + 2i E) 64

14. $z = \sqrt{3} + i \Rightarrow$ $\mathbf{z^{10} = ?}$

A) $2^9\,(1-\sqrt{3}i)$ B) $2^{10}\,(1-\sqrt{3}i)$

C) $2^8\,(1-\sqrt{3}i)$ D) $2^{10}\,(-1+\sqrt{3}i)$

E) $2^{10}\,(\sqrt{3}-i)$

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15. $\left.\begin{aligned} z_1 &= 2\cdot\text{cis}23° \\ z_2 &= 4\cdot\text{cis}16° \end{aligned}\right\} \Rightarrow \mathbf{\frac{z_1{}^4}{z_2{}^2} = ?}$

A) $\frac{1}{2}+\frac{\sqrt{3}}{2}\cdot i$ B) $\frac{1}{2}-\frac{\sqrt{3}}{2}\cdot i$ C) $-\frac{1}{2}-\frac{\sqrt{3}}{2}\cdot i$

D) $1+\sqrt{3}i$ E) $1-\sqrt{3}i$

16. $z_1 = 2\cdot\text{cis}23°$

$z_2 = 4\cdot\text{cis}16°$

$\Rightarrow$ $\mathbf{arg\left(\frac{z_1{}^4}{z_2{}^2}\right) = ?}$

A) 45° B) 60° C) 75° D) 90° E) 120°

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	E	E	D	C	B	D	C
9	10	11	12	13	14	15	16
D	A	A	D	E	A	A	B

1. $z_1 = -2 + 2i$

$z_2 = 1 + i \Rightarrow \mathbf{arg\left(\frac{z_1}{z_2}\right) = ?}$

A) $\frac{\pi}{6}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{2}$ D) $\frac{3\pi}{4}$ E) π

2. $\sqrt{-1} = i,$

$f(z) = (z-1)^2 + z$

$g(z) = z^3 - z^2 + 4z$

$\Rightarrow \mathbf{(gof)(1-i) = ?}$

A) 1+5i B) 1 − 5i C) 5 + i D) 5 − i E) 4i

3. $z \in \mathbb{C},\ z \neq -6i,$

$z^2 + 36 = z + 6i$

$\Rightarrow \mathbf{Re(z) + Im(z) = ?}$

A) 3 B) 5 C) 7 D) 9 E) 11

4. $z \in \mathbb{C},$

$f(z) = \sum_{k=0}^{101} z^k \Rightarrow \mathbf{f(i) = ?}$

A) 1+i B) 1 − i C) i D) − i E) 1

5. $z \in \mathbb{C}$, $Im(z) \neq 0$ ve (and) $z^3 = -1$

$\Rightarrow \mathbf{(z-1)^{10} = ?}$

A) z+1 B) z − 1 C) z D) − z E) − z − 1

6. $i = \sqrt{-1},$

$x < y < 0$ ve (and) $\sqrt{x-y} = 2i$

$\Rightarrow \mathbf{x - y = ?}$

A) 4 B) 2 C) 1 D) − 2 E) − 4

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7. $i=\sqrt{-1}$

$f\left(\frac{x}{i^5}\right)=x^{101}+\frac{1}{x^{29}}+x^{43}$

$\Rightarrow$ **$f(1)=?$**

A) $1-i$ B) $1+i$ C) i D) $-i$ E) 0

8. $z\in\mathbb{C},\ z\neq 0,\ \mathrm{Im}(z)\neq 0$

$z^4+z=0 \Rightarrow$ **$(z-1)^{22}=?$**

A) 0 B) 1 C) z D) $z-1$ E) $z+1$

9. $z\in\mathbb{C}$,

$\mathrm{Re}(i\cdot z)=3$ ve (and) $\mathrm{Re}(z+2)=6$

$\Rightarrow$ **$\mathrm{Re}(z)\cdot\mathrm{Im}(z)=?$**

A) 18 B) 15 C) 12 D) 10 E) 6

10. $z\in\mathbb{C}$,

$\frac{z^2+25}{z+5i}=\frac{z^4-16}{(z-2i)\cdot(z-2)}-z^2$

$\Rightarrow$ **$\mathrm{Re}(z)=?$**

A) $-\frac{5}{9}$ B) $-\frac{9}{5}$ C) $-\frac{18}{5}$ D) $\frac{5}{9}$ E) $\frac{18}{5}$

11. $z^2=12-16i$,

$\frac{1}{z}-\bar{z}=z+(a+ib)\cdot\bar{z}$

$\Rightarrow$ **$a+b=?$**

A) $\frac{4}{3}$ B) $\frac{1}{4}$ C) 0 D) $-\frac{1}{4}$ E) $-\frac{3}{4}$

12. $z\in\mathbb{C}$, $z\neq 0$, $i^2=-1$

$(z\cdot z+z-1)\cdot(\bar{z}-z\cdot z)=z\cdot(z-1)$

$\Rightarrow$ **$\bar{z}-z=?$**

A) $z\cdot\bar{z}$ B) $z\cdot\bar{z}-1$ C) $z\cdot\bar{z}+1$ D) $2z\cdot\bar{z}$ E) $1-z\cdot\bar{z}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
C	B	C	A	B	E	D	D	C	C	E	C

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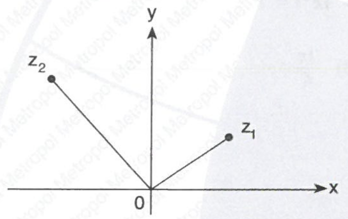
1. $z \in \mathbb{C}$,

$|z| + z = 3 - i\sqrt{3} \Rightarrow$ **z = ?**

A) $1 - i\sqrt{3}$ B) $1 + i\sqrt{3}$ C) $-1 + i\sqrt{3}$ D) $i\sqrt{3}$ E) $-i\sqrt{3}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

2.



$|z_1| = 3$, $|z_2| = 5$

$\arg z_1 = 30°$

$\arg z_2 = 150° \Rightarrow$ $\mathbf{|z_1 + z_2| = ?}$

A) $\sqrt{15}$ B) 4 C) $\sqrt{19}$ D) $\sqrt{21}$ E) $2\sqrt{6}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

3. $z = \dfrac{9}{2+i} - \dfrac{33}{4-3i} \Rightarrow$ **Im(z) = ?**

A) $-\dfrac{9}{25}$ B) $\dfrac{54}{25}$ C) $-\dfrac{42}{25}$ D) $-\dfrac{144}{25}$ E) $\dfrac{222}{25}$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

4. $z \cdot (3+i) = -5 + i - z$

$\Rightarrow$ **z = ?**

A) $1 + 2i$ B) $2 - i$ C) $1 + i$ D) $2i$ E) $-1 + i$

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

5. $x + iy = \dfrac{(1+i)^{52}}{(1-i)^{48}}$

$\Rightarrow$ **x + y = ?**

A) -4 B) -2 C) 0 D) 2 E) 4

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

6. $x, y \in R$,

$(2-i)\cdot(y - xi) + (1+i)\cdot(x - yi) = 3 - 9i$

$\Rightarrow \sqrt{\mathbf{x^2 + y^2}} = ?$

A) $5\sqrt{2}$ B) $4\sqrt{6}$ C) $2\sqrt{10}$ D) $4\sqrt{2}$ E) 3

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

7. $i^2 = -1$,

$f(x) = x^2 - 2x + 4$

$f(x_1) = f(x_2) = 0 \Rightarrow \sqrt{x_1} - \sqrt{x_2} = ?$

A) $2i$ B) $-2i$ C) $\sqrt{2} \cdot i$ D) $2 + i$ E) $-2 + i$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

8. $\dfrac{i^{59} + i^{102}}{i^{985} + i^{348}} = ?$

A) $1 + i$ B) -1 C) i D) $-i$ E) 1

[ANADOLU ÜNİVERSİTESİ – YÖS 2017]

9. $x, y \in R$,

$(3 - 2i)(x + yi) - i(y + xi) = 26 + 8i$

$\Rightarrow x \cdot y = ?$

A) -15 B) -12 C) 18 D) 20 E) 21

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

10. $(5 + 2i) \cdot (2 - 5i) - (2 + 5i) \cdot (5 - 2i) = ?$

A) $-42i$ B) $-50i$ C) $-58i$ D) -40 E) 40

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

11. $z = \sqrt{3} - i \Rightarrow |z^6| = ?$

A) 2^6 B) $(\sqrt{3} + 2)^6$ C) $\dfrac{7\pi}{2}$ D) $\dfrac{9\pi}{4}$ E) $\dfrac{9\pi}{2}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

12. $z \in \mathbb{C}$,

$f(z) = \sum_{k=1}^{101} z^{k-1} \Rightarrow f(i) = ?$

A) 1 B) i C) $-i$ D) -1 E) $i + 1$

[ONSEKİZ MART ÜNİVERSİTESİ – YÖS 2014]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
A	C	D	E	A	A	C	B	E	A	A	A

BÖLÜM CHAPTER 8

TARİHSEL NOT / HISTORICAL NOTE

JOHN NAPİER [1550 - 1617]

Merchiston Baronu ve İskoçyalı bir matematikçi olan Napier, logaritmanın bulucusu olarak bilinir. 1, 2, 3, ... şeklindeki aritmetik dizi ile, buna karşılık gelen 10, 100, 1000, ... biçimindeki geometrik dizi arasındaki ilişkiyi gördü. 1614 yılında yazdığı "Logaritma Kurallarının Tanımı" adlı eserinde, aritmetik dizi ile geometrik dizinin karşılaştırılmasından, matematiğe logaritma kavramını getirdi. Günümüzdekilerden farklı olarak kurulan bu diziler, logaritmayı, sayısının azalan bir fonksiyonu olarak tanımlıyordu. Buradaki aritmetik dizi, geometrik dizinin logaritmasıdır.

The Baron of Merchiston and a Scottish mathematician. He is known as the finder of the logarithm. He saw the relationship between the arithmetic sequence 1, 2, 3, ... and the corresponding geometric sequence 10, 100, 1000, ... In his work titled "Definition of the Logarithm Rules" published in 1614, he introduced the concept of mathematical logarithm derived from the comparison of the arithmetic sequence with the geometric sequence. These sequences, which were established differently then, defined the logarithm as a decreasing function of the numbers. The arithmetic sequence here is the logarithm of the geometric sequence.

LOGARİTMA
LOGARITHM

Bu bölüm 64 alıştırma sorusu, 162 test sorusu, 12 YÖS sorusu içermektedir.

This chapter includes 64 exercise questions, 162 test questions, and 12 YÖS questions.

BÖLÜM / CHAPTER 8

LOGARİTMA / LOGARITHM

- Logaritma / Logarithm .... 215 – 246

BÖLÜM 08 CHAPTER

LOGARİTMA
LOGARITHM

1. $2^x = 10 \Rightarrow x = ?$

Yanıt / The Answer is $\log_2 10$

2. $7^x = 20 \Rightarrow x = ?$

Yanıt / The Answer is $\log_7 20$

3. $\log_3 x = 4 \Rightarrow x = ?$

Yanıt / The Answer is 81

4. $\log_2 x = 7 \Rightarrow x = ?$

Yanıt / The Answer is 2^7

5. $\log_3 27 = ?$

Yanıt / The Answer is 3

6. $\log_2 \frac{1}{64} = ?$

Yanıt / The Answer is -6

7. $\log_9 243 = ?$

Yanıt / The Answer is $\frac{5}{2}$

8. $2^{x-1} = 3 \Rightarrow x = ?$

Yanıt / The Answer is $\log_2 6$

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9. $3^{x+3} = 4 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is $\log_3 4 - 3$

10. $1 + \log_2 x = 3 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is **4**

11. $\log_3(4 - x) = 2$

Yanıt / The Answer is **–5**

12. $e^{2x} = 4 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is $\ln 2$

13. $e^{x-1} = 3 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is $\ln 3 + 1$

14. $\log_3 27 = x \Rightarrow 2^{x-1} = ?$

Yanıt / The Answer is **4**

15. $\log_{8\sqrt{2}} x = 16 \Rightarrow 3^{x-1} = ?$

Yanıt / The Answer is **27**

16. $\log_3(\log_3 x) = 1 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is **27**

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17. $\log_2\left(1+\log_3(x-2)\right)=2 \Rightarrow x=?$

Yanıt / The Answer is 29

18. $\log_{\frac{1}{3}}\left(\log_4(2x+1)\right)=0 \Rightarrow x=?$

Yanıt / The Answer is $\frac{3}{2}$

19. $\log\left(5+\log_2(2x+2)\right)=1 \Rightarrow x=?$

Yanıt / The Answer is 15

20. $\ln\left(e^3+\log_2(x+1)\right)=3 \Rightarrow x=?$

Yanıt / The Answer is 0

21. $\log_3(28+\log_2 x)=3 \Rightarrow x=?$

Yanıt / The Answer is $\frac{1}{2}$

22. $\log 10+\ln 1=?$

Yanıt / The Answer is 1

23. $\dfrac{3\cdot \ln e^2+\log_3 1}{\log_{\sqrt{3}} 3+2\cdot \log 10}=?$

Yanıt / The Answer is $\frac{3}{2}$

24. $\log_{\frac{1}{2}} 8-\log_{\frac{1}{9}} 27+\log_{\sqrt{5}} 25=?$

Yanıt / The Answer is $\frac{5}{2}$

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25. $\ln(\sqrt[3]{e}) + \ln(\sqrt[4]{e}) = ?$

Yanıt / The Answer is $\frac{7}{12}$

26. $\log(0{,}0001) + \log\frac{1}{1000} = ?$

Yanıt / The Answer is -7

27. $\log_2 3 = x \Rightarrow \log_9 4 = ?$

Yanıt / The Answer is $\frac{1}{x}$

28. $\log_a b = 16 \Rightarrow \log_{a^2}\sqrt{b} = ?$

Yanıt / The Answer is 4

29. $x^3 = y^2 \Rightarrow \log_y x^2 = ?$

Yanıt / The Answer is $\frac{4}{3}$

30. $\log_{182} 2 + \log_{182} 7 + \log_{182} 13 = ?$

Yanıt / The Answer is 1

31. $\ln 2 + \ln 4 + \ln 8 = ?$

Yanıt / The Answer is $6 \cdot \ln 2$

32. $\dfrac{\log_2 48 - \log_2 3}{\log_3 36 - \log_3 4} = ?$

Yanıt / The Answer is 2

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33. $\left.\begin{array}{l}\log 2 = x \\ \log 3 = y\end{array}\right\} \Rightarrow \log 36 = ?$

Yanıt / The Answer is $2\cdot(x+y)$

34. $\left.\begin{array}{l}\log_x 3 = 4 \\ \log_y 3 = 2\end{array}\right\} \Rightarrow \log_3(x\cdot y) = ?$

Yanıt / The Answer is $\frac{3}{4}$

35. $\frac{1}{\log_5 15} + \frac{1}{\log_3 15} = ?$

Yanıt / The Answer is 1

36. $\log_{25}9 \cdot \log_{27}16 \cdot \log_4 5 = ?$

Yanıt / The Answer is $\frac{2}{3}$

37. $\frac{1}{2}\cdot\log x - 2\cdot\log y + \frac{1}{3}\cdot\log z = ?$

Yanıt / The Answer is $\log\frac{\sqrt[6]{x^3 z^2}}{y^2}$

38. $f(x) = \log_5 x \Rightarrow f^{-1}(x) = ?$

Yanıt / The Answer is 5^x

39. $f(x) = 1 + \log_3(x-2) \Rightarrow f^{-1}(x) = ?$

Yanıt / The Answer is $3^{x-1}+2$

40. $f(x) = \ln(x-2) \Rightarrow f^{-1}(x) = ?$

Yanıt / The Answer is $e^x + 2$

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41. $f(x) = \ln\left(\frac{x-5}{3}\right) \Rightarrow f^{-1}(x) = ?$

Yanıt / The Answer is $3 \cdot e^x + 5$

42. $\log a + 3 \cdot \log b - 2 \cdot \log c = ?$

Yanıt / The Answer is $\log\left(\frac{a \cdot b^3}{c^2}\right)$

43. $x = \log_2 12$

$y = \log_5 20$

$z = \log_3 15$

$\Rightarrow ? < ? < ?$

Yanıt / The Answer is $y < z < x$

44. $a = \log_{\frac{1}{4}} 40$

$b = \log_{\frac{1}{3}} 30$

$c = \log_{\frac{1}{2}} 20$

$\Rightarrow ? < ? < ?$

Yanıt / The Answer is $c < b < a$

45. $3^{\log_9 3} = ?$

Yanıt / The Answer is $\sqrt{3}$

46. $4^{\frac{1}{\log_3 4}} = ?$

Yanıt / The Answer is 3

47. $2^{\log_2 7} + e^{\ln 7} = ?$

Yanıt / The Answer is 14

48. $x^{\log_5 3} = 3^{\log_5 4} \Rightarrow x = ?$

Yanıt / The Answer is 4

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49. $(\sqrt[3]{2})^{\log_2 27} = ?$

Yanıt / The Answer is **3**

50. $3^{2x} + 3^{x+1} - 28 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{\log_3 4\}$

51. $(\log x)^2 - \log x^5 + 4 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{10, 10^4\}$

52. $e^x - 10 \cdot e^{-x} - 3 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{\ln 5\}$

53. $2e^x - 3 \cdot e^{-x} - 5 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{\ln 3\}$

54. $\log_5(5x+1) - \log_5(3x+51) = 0 \Rightarrow \log_5 x = ?$

Yanıt / The Answer is **2**

55. $\log_3(x+1) = 3 + \log_3 x \Rightarrow x = ?$

Yanıt / The Answer is $\frac{1}{26}$

56. $16^{\log_2 \sqrt{x+1}} = x^3 + x^2 + 2x - 7 \Rightarrow x^3 = ?$

Yanıt / The Answer is **8**

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57. $f(x) = 8^{\log_2(x-1)} \Rightarrow f(\sqrt[3]{5}+1) = ?$

Yanıt / The Answer is 5

58. $f(x) = \log_3(8x+a),\ f^{-1}(3) = 5 \Rightarrow a = ?$

Yanıt / The Answer is –13

59. $\log_3(3x-1) + \log_3 2 \geqslant 3 \Rightarrow \text{ÇK(SS)} = ?$

Yanıt / The Answer is $\left[\frac{29}{6}, \infty\right)$

60. $\log_5(2x-4) < 1 \Rightarrow \text{ÇK(SS)} = ?$

Yanıt / The Answer is $\left(2, \frac{9}{2}\right)$

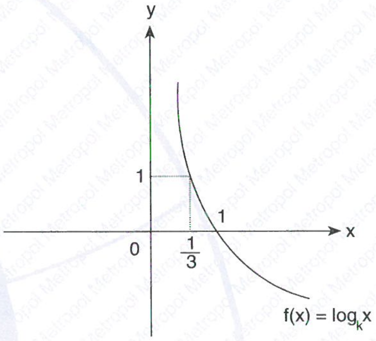
61. $\log 2 = x,$

$\log 3 = y$

$\Rightarrow \log 72 = ?$

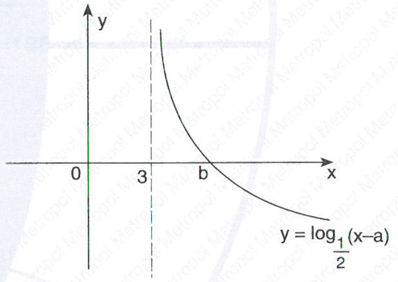
Yanıt / The Answer is $3x + 2y$

62. $f(9) + f^{-1}(-3) = ?$



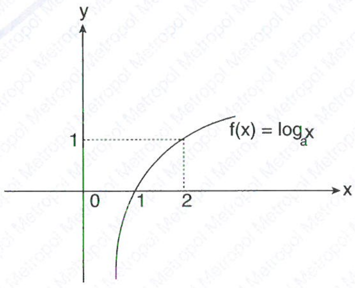
Yanıt / The Answer is 25

63. $a + b = ?$



Yanıt / The Answer is 7

64. $f(16) = ?$



Yanıt / The Answer is 4

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1. $\log_2(x-1) = 3 \Rightarrow$ **x = ?**

A) 6 B) 7 C) 9 D) 10 E) 12

2. $\log_{\sqrt{2}} 32 = x \Rightarrow$ **x = ?**

A) 5 B) 6 C) 8 D) 9 E) 10

3. $\log_4 128 = a + 2 \Rightarrow$ **a = ?**

A) $\frac{1}{2}$ B) $\frac{2}{5}$ C) 1 D) $\frac{3}{2}$ E) 2

4. **$\log_2 8 + \log_{\sqrt{3}} 9 = ?$**

A) 5 B) 6 C) 7 D) 8 E) 9

5. $\log_{\frac{1}{5}}\left(\frac{x-3}{4}\right) = -2 \Rightarrow$ **x = ?**

A) 96 B) 97 C) 103 D) 106 E) 113

6. $\log_2(\log_2(x+1)) = 2 \Rightarrow$ **x = ?**

A) 3 B) 7 C) 15 D) 31 E) 63

7. $\log_5(x-2) = 2 \Rightarrow$ **$\log_3 x = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

8. $\ln(e^{3x-2}) = 13 \Rightarrow$ **x = ?**

A) 3 B) 4 C) 5 D) 6 E) 8

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9. $a = \log_3 25,\ b = \log_2 17,\ c = \log_5 20$

$\Rightarrow$ **? < ? < ?**

A) $a < b < c$
B) $c < a < b$
C) $b < c < a$
D) $a < c < b$
E) $c < b < a$

10. $x = \log_{\frac{1}{2}} 14\ ,\ y = \log_{\frac{1}{4}} 26\ ,\ z = \log_{\frac{1}{16}} 30$

$\Rightarrow$ **? > ? > ?**

A) $z > x > y$
B) $x > y > z$
C) $x > z > y$
D) $z > y > x$
E) $y > z > x$

11. $\dfrac{\log_5 \sqrt{5}}{\log_{\sqrt{7}} 7} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 4

12. $\log_3 81 + \log_5 625 - \log_{10} 0{,}001 = ?$

A) 3 B) 5 C) 8 D) 11 E) 14

13. $\log_2[1 + \log_3(x - 2)] = 1 \Rightarrow x = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

14. $\log_3\left[2 - \log_4\left[5 + \log_2\left(3x - \frac{5}{2}\right)\right]\right] = 0 \Rightarrow x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

15. $\log_2\left[4 \cdot \log_5(5 \cdot \log_4(x + 7))\right] = 2 \Rightarrow x = ?$

A) 2 B) 1 C) – 2 D) – 3 E) – 4

16. $\log_2\left[\log_3\left(\log_3(x - 2)\right)\right] = 0 \Rightarrow x = ?$

A) 25 B) 23 C) 27 D) 29 E) 21

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	E	D	C	C	C	C	C
9	10	11	12	13	14	15	16
B	D	A	D	C	A	D	D

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1. $2^x = 7 \Rightarrow$ **x = ?**

A) $\log_7 2$ B) $\log_2 7$ C) $\log_2 14$ D) $\log_2 49$ E) $\log_7 4$

2. $f(x) = \log_3(2x-7) \Rightarrow$ **$f^{-1}(2) = ?$**

A) 3 B) 4 C) 6 D) 8 E) 12

3. $f(x) = \log_5(x-3) \Rightarrow$ **$f^{-1}(x) = ?$**

A) -3^x+5 B) -5^x+3 C) 5^x+3 D) 5^{x+3} E) 3^x+5

4. $f(x) = \log_3(5x-1) \Rightarrow$ **$f^{-1}(x) = ?$**

A) $\frac{3^x-1}{5}$ B) $\frac{3^x+1}{5}$ C) 3^x D) $\log_5(5x+1)$ E) $\frac{x^5+1}{5}$

5. $f(x) = \log_2(3x-1) \Rightarrow$ **$f^{-1}(x) = ?$**

A) 2^x-1 B) $\frac{2^x-1}{3}$ C) $\frac{2^x+1}{3}$ D) $\frac{3^x-1}{2}$ E) $\frac{3^x+1}{2}$

6. $f(x) = 5^{x+1} \Rightarrow$ **$f^{-1}(x) = ?$**

A) $\frac{x-1}{5}$ B) $\log_5 x$ C) $1-\log_5 x$ D) $\log_5 x - 1$ E) $5 \cdot \log_5 x - 1$

7. $f(x) = 3^{x+2}-2 \Rightarrow$ **$f^{-1}(x) = ?$**

A) $-2+\log_3(x+2)$ B) $2-\log_3(x+2)$ C) $\frac{1}{9} \cdot \log_3(x+2)$ D) $\frac{1}{9} \cdot \log_3(x-2)$ E) $2+\log_3(x-2)$

8. $f(x) = 2^{x-3}+1 \Rightarrow$ **$f^{-1}(x) = ?$**

A) $-3+\log_2(x-1)$ B) $-3+\log_2(x+1)$ C) $3-\log_2(x-1)$ D) $3-\log(x+1)$ E) $3+\log_2(x-1)$

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9. $f(x) = 3^{\ln x} \Rightarrow$ **$f^{-1}(x) = ?$**

A) $3^{\ln x}$ B) $e^{\log_3 x}$ C) $10^{\log_3 x}$ D) $\ln x + 3$ E) $e^{\log_3 x + 1}$

10. $f(x) = \ln(2x + 3) - 4 \Rightarrow$ **$f^{-1}(x) = ?$**

A) $\frac{e^{x-4}-3}{2}$ B) $\frac{e^{x+4}-3}{2}$ C) $\frac{e^{x-4}+3}{2}$ D) $\frac{e^{x+4}-2}{3}$ E) $\frac{e^{x-4}+2}{3}$

11. $\left.\begin{array}{l} f(x) = \log_3 x \\ (fog)(x) = 2x - 1 \end{array}\right\} \Rightarrow$ **$g(x) = ?$**

A) 3^x B) 3^{x-1} C) 3^{2x-1} D) $3^x - 1$ E) $2 \cdot 3^x + 1$

12. $f(x) = \log_2 x$,

$(gof)(x) = 2^x + 3 \Rightarrow$ **$g(2) = ?$**

A) 8 B) 10 C) 12 D) 16 E) 19

13. $f(x) = 3 + \log_3(x+4)$

$\Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -4)$ B) $(-4, 0)$ C) $(-4, \infty)$ D) $(4, \infty)$ E) $R - \{-4\}$

14. $\log_x(6x - 8) = 2 \Rightarrow$ **$\sum x = ?$**

A) 2 B) 4 C) 6 D) 8 E) 10

15. $x \in Z$,

$f(x) = \log_x(25 - x^2) \Rightarrow$ **$\sum x = ?$**

A) 10 B) 9 C) 8 D) 7 E) 6

16. $f(x) = \ln 4 + \ln e^{2x-1}$

$\Rightarrow$ **$f^{-1}(1) = ?$**

A) –ln2 B) 1+ln2 C) 1–ln2 D) 2+ln2 E) 2–ln2

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1	2	3	4	5	6	7	8
B	D	C	B	C	D	A	E
9	10	11	12	13	14	15	16
B	B	C	E	C	C	B	C

1. $x \in Z$,

$f(x) = \log_3\left(\frac{x-5}{x-2}\right) \Rightarrow \sum x = ?$

A) –19 B) –14 C) –8 D) 8 E) 14

2. $x \in Z$,

$f(x) = \log_{(x-2)}(8-x) \Rightarrow \sum x = ?$

A) 21 B) 22 C) 23 D) 24 E) 25

3. $\log_{(x-3)}\left(\frac{x+1}{x-1}\right) \in R \Rightarrow$ **ÇK(SS) = ?**

A) $(1, \infty)$
B) $(1, \infty) - \{4\}$
C) $(3, \infty)$
D) $(3, \infty) - \{4\}$
E) $(1, 3)$

4. $\log\left(\frac{5x-7}{4x+8}\right) = 0 \Rightarrow$ **x = ?**

A) $\frac{7}{5}$ B) $\frac{5}{7}$ C) 5 D) 10 E) 15

5. $\log 2 = x \Rightarrow$ **log 5 = ?**

A) $1-x$ B) $x-1$ C) x D) $\frac{x-1}{2}$ E) $2x-1$

6. $\log 125 = x \Rightarrow$ **log 2 = ?**

A) $3-x$ B) $x-3$ C) $3+x$ D) $\frac{x-3}{3}$ E) $\frac{3-x}{3}$

7. $x \in Z$,

$\log_2(x-5) < 3 \Rightarrow \sum x = ?$

A) 63 B) 65 C) 68 D) 72 E) 78

8. $x \in Z$,

$\log_4 9 + \log_2(x-3) < 5 \Rightarrow \sum x = ?$

A) 60 B) 72 C) 81 D) 85 E) 90

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9. $\log_{\frac{1}{3}}(x-4)\geq 2 \Rightarrow$ **ÇK(SS) = ?**

A) $3<x<4$ B) $3<x\leq\frac{35}{9}$ C) $4<x<\frac{37}{9}$ D) $4<x\leq\frac{37}{9}$ E) $4<x\leq\frac{41}{9}$

10. $x\in Z$,

$\log_{\frac{1}{2}}(x+3)\geq -2 \Rightarrow \sum x = ?$

A) –4 B) –2 C) 2 D) 4 E) 6

11. $2\leq \log_2(x+5)\leq 4 \Rightarrow$ **ÇK(SS) = ?**

A) (–1, 11) B) (1, 11) C) [–1, 11) D) [–1, 11] E) [–11, 1]

12. $x\in Z$,

$\log_2(\log_3(x+3))<1 \Rightarrow \sum x = ?$

A) 10 B) 12 C) 14 D) 16 E) 18

13. $\log_{0.8}\left(\frac{x-1}{7-x}\right)\leq 0 \Rightarrow$ **ÇK(SS) = ?**

A) (1, 4] B) [1, 7) C) (7, ∞) D) [4, 7) E) (–∞, 7)

14. $\log_5(2x-3)-\log_5(-x+6)=0 \Rightarrow$ **x = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

15. $\log_2(x+4)-\log_2(x+1)=2 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

16. $\log_3(\log(8x))-\log_3(\log(10x-1))=0 \Rightarrow$ **x = ?**

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

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1	2	3	4	5	6	7	8
B	B	D	E	A	E	A	D
9	10	11	12	13	14	15	16
D	B	D	B	D	D	A	A

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1. $\log_{81}729 = ?$

A) 3 B) 3^2 C) $\frac{3}{2}$ D) $\frac{9}{4}$ E) $\frac{27}{8}$

2. $\log_2 (5 \cdot \log_5 \sqrt[5]{25}) = ?$

A) 1 B) 5 C) 10 D) 25 E) 50

3. $\log_5 \frac{1}{125} + \log_{\frac{1}{2}} 32 \cdot \log_9 81 = ?$

A) –26 B) 26 C) 0 D) 13 E) –13

4. $\log_3 \sqrt{27} - \log_4 8 + \log_5 1 = ?$

A) 0 B) 1 C) 3 D) 9 E) 12

5. $\log_a a^{3\sqrt{a}} = 3 \Rightarrow a = ?$

A) 3 B) 3^2 C) 3^3 D) 3^4 E) 3^5

6. $a = \log_5 \frac{1}{x}$, $x = 5^2 \Rightarrow \log_2(14 - a) = ?$

A) 4 B) 8 C) 12 D) 16 E) 20

7. $\log_2[\log_3(\log_5 x)] = 2 \Rightarrow \log_{125} x = ?$

A) 27 B) 25 C) 18 D) 36 E) 16

8. $\log_3 x = 0,7\overline{9} \Rightarrow \sqrt{x^5} = ?$

A) 3 B) 9 C) 27 D) 81 E) 117

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9. $\log_3 x = \log_{\frac{1}{9}} y \Rightarrow \log_3(x^4 \cdot y^2) = ?$

A) 3 B) 2 C) 1 D) 0 E) –2

10. $a \in R^+$,

$5^a = b$,

$\log_b 625 = a \Rightarrow \log_b 5 = ?$

A) $\frac{1}{12}$ B) $\frac{1}{6}$ C) $\frac{1}{3}$ D) $\frac{1}{2}$ E) 1

11. $y = \log_{125} x$,

$x = \frac{1}{5} \Rightarrow y = ?$

A) $-\frac{1}{18}$ B) $-\frac{1}{9}$ C) $-\frac{1}{3}$ D) -1 E) -2

12. $a^9 = b \Rightarrow \log_b a^{27} = ?$

A) –3 B) 3 C) – 6 D) 6 E) 12

13. $\log_6 4 + \log_6 27 + \log_6 2 = ?$

A) 12 B) 9 C) 6 D) 3 E) $\frac{1}{3}$

14. $\log_3 648 - \log_3 8 = a \Rightarrow \log_a 2 = ?$

A) $\frac{1}{16}$ B) $\frac{1}{8}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) $\frac{1}{3}$

15. $\frac{1}{\log_3 60} + \frac{1}{\log_4 60} + \frac{1}{\log_5 60} = ?$

A) 1 B) 3 C) 4 D) 5 E) 6

16. $\log_3 6 - \log_3(x-1) = 2 \Rightarrow x = ?$

A) $\frac{5}{3}$ B) $\frac{5}{2}$ C) $\frac{3}{2}$ D) $\frac{1}{6}$ E) $\frac{3}{4}$

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1	2	3	4	5	6	7	8
C	A	E	A	C	A	A	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	D	C	B	D	D	A	A

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1. $x = \log_2\left(\frac{3}{2}\right)$, $y = \log_2\left(\frac{32}{3}\right) \Rightarrow$ **x + y = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

2. $\log_5(x-2)+\log_5(x+2)=1 \Rightarrow$ **ÇK(SS) = ?**

A) $\{3\}$ B) $\{4,5\}$ C) $\{4\}$ D) $\{5\}$ E) $\{2,5\}$

3. $\log_2(5x-2) - \log_2(x+3) = \log_4 16 \Rightarrow$ **x = ?**

A) 8 B) 12 C) 14 D) 16 E) 18

4. $\log(3x-7) - \log(x+1) = 0 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $\frac{1}{\log_2 x} + \frac{1}{\log_4 x} + \frac{1}{\log_8 x} + \ldots + \frac{1}{\log_{256} x} = 72$

$\Rightarrow$ **x = ?**

A) $\sqrt{2}$ B) 2 C) $2\sqrt{2}$ D) 4 E) $4\sqrt{2}$

6. $\log_3 x = \log_3 54 + \log_3 12 - \log_3 8 \Rightarrow$ **x = ?**

A) 2 B) 3 C) 9 D) 27 E) 81

7. $\frac{6}{\log_3 90} + \frac{3}{\log_2 90} + \frac{1}{\log_{125} 90} = ?$

A) 1 B) $\frac{3}{2}$ C) 2 D) 3 E) 4

8. $\frac{3}{\log_2 x} - \frac{2}{\log_3 x} + \log_x 9 = 3 \Rightarrow$ **x = ?**

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 2 D) 3 E) 4

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9. $\left.\begin{array}{l}\log_2(x\cdot y)=4\\ \log_2\left(\frac{x}{y}\right)=2\end{array}\right\} \Rightarrow$ **y = ?**

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 8

10. $\left.\begin{array}{l}\log\left(\frac{x}{y}\right)=2\\ \log(x\cdot y)=8\end{array}\right\} \Rightarrow$ **y = ?**

A) 10^{-3} B) 10^{-2} C) 10 D) 10^2 E) 10^3

11. $\log_3 4 \cdot \log_{16} e^2 \cdot \ln 27 = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

12. $\log_{3\sqrt{2}} 9 \cdot \log_{125} 16 \cdot \log_{3\sqrt{3}} \sqrt{5} = ?$

A) 24 B) 18 C) 12 D) 6 E) 3

13. $\log_9 2 \cdot \log_4 25 \cdot \log_5 (x+1) = 2 \Rightarrow$ **x = ?**

A) 63 B) 65 C) 78 D) 80 E) 82

14. $\log_2 5 \cdot \log_5 7 \cdot \log_7 8 = \log_x(5x^2+6x) \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

15. $\log_3 5 = x,\ \log_3 7 = y \Rightarrow$ **$\log_7 5$ = ?**

A) $\frac{y}{x}$ B) $x\cdot y$ C) $x+y$ D) $x-y$ E) $\frac{x}{y}$

16. $a \in R^+$,

$\left.\begin{array}{l}\ln(x\cdot y)=a\\ \ln\left(\frac{x}{y}\right)=b\end{array}\right\} \Rightarrow$ **x = ?**

A) e B) e^{a+b} C) $2\cdot e^{a+b}$ D) $e^{\frac{a+b}{2}}$ E) $4\cdot e^{a+b}$

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1	2	3	4	5	6	7	8
D	A	C	D	A	E	D	C
9	10	11	12	13	14	15	16
D	E	C	C	D	E	E	D

1. $\log 2 = a \Rightarrow$ **$\log 25 = ?$**

A) $3a + 3$ B) $3a$ C) $3a - 3$ D) $2 - 2a$ E) $2a - 2$

2. $\log 4 = x \Rightarrow$ **$\log 25 = ?$**

A) $1 - x$ B) $1 + x$ C) $2 - x$ D) $2 + x$ E) $1 + 2x$

3. $\log 4 = a \Rightarrow$ **$\log \frac{1}{125} = ?$**

A) $3 \cdot (a - 2)$ B) $\frac{3 \cdot (a-2)}{2}$ C) $3a - 4$ D) $a - 4$ E) $\frac{a-1}{a+2}$

4. $\log_2 5 = x \Rightarrow$ **$\log_{\sqrt{2}} 25 = ?$**

A) $\frac{x}{4}$ B) $\frac{x}{2}$ C) x D) $2x$ E) $4x$

5. $\log_6 2 = x \Rightarrow$ **$\log_6 3 = ?$**

A) $2x$ B) $-1 - x$ C) $1 - x$ D) $x - 1$ E) $1 + x$

6. $\log_3 15 = a \Rightarrow$ **$\log_5 75 = ?$**

A) $\frac{2a-1}{a-1}$ B) $\frac{2a-3}{a-1}$ C) $\frac{2a-1}{a+1}$ D) $\frac{2a-3}{a+1}$ E) $\frac{2a}{a-1}$

7. $\log_2 3 = a \Rightarrow$ **$\log_9 48 = ?$**

A) $\frac{4-a}{a}$ B) $\frac{4-a}{2a}$ C) $\frac{4+a}{a}$ D) $\frac{4+a}{2a}$ E) $\frac{6+a}{2a}$

8. $\left.\begin{matrix} \log_2 3 = a \\ \log_2 5 = b \end{matrix}\right\} \Rightarrow$ **$\log_2 675 = ?$**

A) $3a + 2b$ B) $3a + b$ C) $3a - 2b$ D) $3a - b$ E) $2a + 2b$

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9. $\left.\begin{array}{l}\log_3 5 = a \\ \log_{25} 8 = b\end{array}\right\} \Rightarrow \mathbf{\log_2 3 = ?}$

A) $\frac{2}{3 \cdot a \cdot b}$ B) $\frac{3 \cdot a \cdot b}{2}$ C) $\frac{3}{2 \cdot a \cdot b}$ D) $\frac{2 \cdot a \cdot b}{3}$ E) $a \cdot b$

10. $\log_{7!} 2 = a \Rightarrow \mathbf{\log_2 8! = ?}$

A) $\frac{3a+1}{a}$ B) $\frac{2a+1}{a}$ C) $a+3$ D) $3a$ E) $3a+1$

11. $\log 35 = a, \ \log 5 = b \Rightarrow \mathbf{\log 7 = ?}$

A) $b-a$ B) $a-b$ C) $a+b$ D) $a \cdot b$ E) $\frac{a}{b}$

12. $\left.\begin{array}{l}\log 2 = a \\ \log 11 = b\end{array}\right\} \Rightarrow \mathbf{\log_5 484 = ?}$

A) $\frac{2(a+b)}{1-a}$ B) $\frac{a+b}{1-b}$ C) $\frac{2b}{a+b}$ D) $\frac{a}{a-b}$ E) $\frac{2a-b}{1+a}$

13. $\log_{12} 36 = a \Rightarrow \mathbf{\log_3 2 = ?}$

A) $\frac{2+a}{2a+2}$ B) $\frac{2-a}{2a+2}$ C) $\frac{2-a}{2a-2}$ D) $\frac{2+a}{2a}$ E) $\frac{2-a}{2a-1}$

14. $x^{\log 2} + 4 \cdot 2^{\log x} = 10$

$\Rightarrow \mathbf{x = ?}$

A) 1000 B) 100 C) 10 D) 1 E) $\frac{1}{10}$

15. $\log_5 3 = a,$

$\log_5 2 = b \Rightarrow \mathbf{\log_{45} 100 = ?}$

A) $\frac{2-2b}{2a}$ B) $\frac{2+2b}{2a}$ C) $\frac{2+2b}{2a+1}$ D) $2-2b$ E) $2+2b$

16. $\log_3 5 = m \Rightarrow \mathbf{\log_9 125 + \log_5 27 = ?}$

A) $\frac{m^2+6}{2m}$ B) $\frac{m^2-6}{2m}$ C) $\frac{3m^2-6}{2m}$ D) $\frac{3m^2+6}{2m}$ E) $\frac{m^2+6}{4m}$

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1	2	3	4	5	6	7	8
D	C	B	E	C	A	D	A
9	10	11	12	13	14	15	16
C	A	B	A	C	C	C	D

1. $3 \cdot \log 5 + 2 \cdot \log 2 - 2 \cdot \log\sqrt{5} = ?$

A) 5 B) 2 C) 1 D) – 2 E) – 5

2. $\log x = 3{,}6 \Rightarrow \sqrt[9]{x^5} = ?$

A) 10 B) 10^3 C) 10^2 D) 10^4 E) 1

3. $\log_5 (625)^{x-2} = 12 \Rightarrow x = ?$

A) –6 B) 6 C) 10 D) –5 E) 5

4. $9^{\log_3 2} = \log_2(x+9) \Rightarrow x = ?$

A) 3 B) 5 C) 7 D) 9 E) 11

5. $\log_7 125 = a \Rightarrow \log_{49} 625 = ?$

A) $\frac{a}{2}$ B) $\frac{3a}{2}$ C) $\frac{a}{3}$ D) $\frac{2a}{3}$ E) 2a

6. $\log_3 25 \cdot \log_5 e \cdot \ln\sqrt{3} = ?$

A) $\frac{1}{2}$ B) 2 C) 1 D) 3 E) 4

7. $A = \log_4 125 \cdot \log_5 256 - \log_7 27 \cdot \log_3 7$

$\Rightarrow A = ?$

A) 9 B) 18 C) 27 D) 54 E) 81

8. $7^{2 \cdot \log_7 x + \log_7 x} = 125 \Rightarrow x = ?$

A) 14 B) 7 C) –7 D) 5 E) 10

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9. $2^{\log_x 3} + 3^{\log_x 2} = 4 \Rightarrow$ **x = ?**

A) $\sqrt{3}$ B) 3 C) −3 D) 9 E) − 9

10. $\log_7 6 = a$

$\Rightarrow$ $\mathbf{\log_7 42 + \log_6 42 - \log_5 625 = ?}$

A) $(a-1)^2$ B) $a\cdot(a-1)^2$ C) $\dfrac{a}{(a-1)^2}$ D) $\dfrac{(a-1)^2}{a}$ E) a^3

11. $\log\dfrac{x}{a\cdot b} + \log b - \log x = ?$

A) $-\log x$ B) $-\log b$ C) $-\log(a\cdot b)$ D) $-\log a$ E) $-\log\left(\dfrac{b}{a}\right)$

12. $\log_5 2 = x \Rightarrow$ **log20 = ?**

A) $2x$ B) $2x+1$ C) $\dfrac{x+1}{2x+1}$ D) $\dfrac{2x-1}{x+1}$ E) $\dfrac{2x+1}{x+1}$

13. $\log a + 6\cdot\log\dfrac{1}{a} = \log 256 - \dfrac{3}{2}\cdot\log a^4 \Rightarrow$ $\mathbf{\log_4 a = ?}$

A) 16 B) 32 C) 64 D) 8 E) 4

14. $x \in Z,$

$\log_3 x = 6\cdot\log_x 3 + 1 \Rightarrow$ **x = ?**

A) 18 B) 3^3 C) −18 D) -3^3 E) 36

YANITLAR / ANSWERS

1	2	3	4	5	6	7
B	C	E	C	D	C	A
8	9	10	11	12	13	14
D	B	D	D	E	E	B

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1. $5^{\log_5 x} + 3^{\log_3 5} = \log_2 256 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

2. $5^{\log_5(x-2)} + e^{\ln(2x-7)} = x + 7 \Rightarrow$ **x = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

3. $e^{\log_x 4} + 4^{\log_x e} = 32 \Rightarrow$ **x = ?**

A) $\sqrt[3]{e}$ B) $\sqrt{e}$ C) e D) e^2 E) e^3

4. $\left.\begin{array}{l}\log_5 4 = a \\ \log_4 9 = b \\ \log_{25} 3 = c\end{array}\right\} \Rightarrow \dfrac{a\cdot b}{c} = ?$

A) 1 B) 3 C) 4 D) 6 E) 8

5. $\left.\begin{array}{l}\log(a\cdot b\cdot c^2) = 2 \\ \log\left(\dfrac{a^2\cdot b}{c}\right) = 3 \\ \log\left(\dfrac{b}{c}\right) = 4\end{array}\right\} \Rightarrow a\cdot b = ?$

A) 10^2 B) 10^3 C) 10^6 D) 10^7 E) 10^{12}

6. $\ln^2 x - \ln x - 2 = 0 \Rightarrow \prod x = ?$

A) e^3 B) e^2 C) e D) $\frac{1}{e}$ E) 1

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7. $e^{2x} - e^{x} - 6 = 0 \Rightarrow$ **ÇK(SS) = ?**

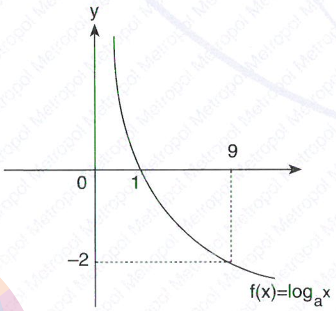
A) {ln2} B) {ln3} C) {ln2, ln3} D) {ln6} E) $\varnothing$

8. $x^{\log_2 x} = 32x^4$, ÇK(SS) = $\{x_1, x_2\}$

$\Rightarrow$ $\mathbf{x_1 \cdot x_2 = ?}$

A) 4 B) 8 C) 16 D) 32 E) 64

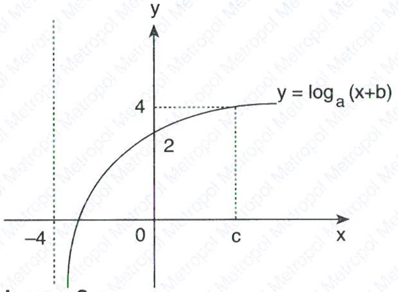
9.



$\Rightarrow$ **a = ?**

A) 9 B) 3 C) $\frac{1}{3}$ D) $\frac{1}{\sqrt{3}}$ E) $\frac{1}{9}$

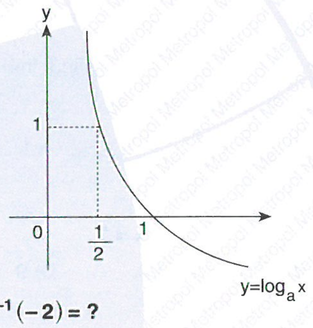
10.



$\Rightarrow$ **a + b + c = ?**

A) 18 B) 16 C) 14 D) 12 E) 10

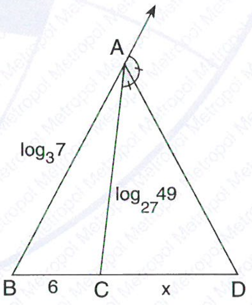
11.



$\Rightarrow$ $\mathbf{f(2) + f^{-1}(-2) = ?}$

A) 3 B) 4 C) 5 D) –3 E) –4

12.



$\Rightarrow$ **x = ? br(u)**

A) 9 B) 12 C) 15 D) 18 E) 21

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1	2	3	4	5	6	7	8	9	10	11	12
C	C	B	C	B	C	B	C	C	A	A	B

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1. $\log_2 x + \log_2 (x-1) = 1 \Rightarrow$ **ÇK(SS) = ?**

A) $\{-1, 2\}$ B) $\{-1\}$ C) $\{2\}$ D) $\varnothing$ E) R

2. $e^x - 12 \cdot e^{-x} + 1 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{-3, 4\}$ B) $\{-4, 3\}$ C) $\{\ln 4\}$ D) $\{\ln 3\}$ E) $\{\ln 3, \ln 4\}$

3. $e^{-2\ln x} - e^{-\ln x} - 2 = 0 \Rightarrow \sum x = ?$

A) $\frac{3}{2}$ B) $\frac{3}{4}$ C) $\frac{1}{2}$ D) 0 E) $-\frac{1}{2}$

4. $(\ln x)^2 - 2 \cdot \ln x - 15 = 0 \Rightarrow \prod x = ?$

A) e^{-3} B) e^{-2} C) 1 D) e^2 E) e^3

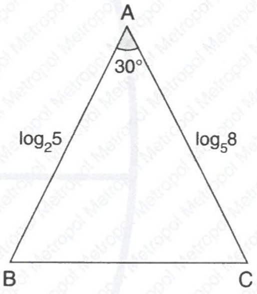
5. $x^{\log_3 x} - 9^2 = 0 \Rightarrow \prod x = ?$

A) 9 B) 1 C) $\frac{1}{3}$ D) $\frac{1}{9}$ E) $\frac{1}{81}$

6. $x^{\ln x} = e^{\ln x + 2} \Rightarrow$ **ÇK(SS) = ?**

A) $\{e^{-1}, e^2\}$ B) $\{e^{-2}, e^2\}$ C) $\{e^2\}$ D) $\{e^{-2}, e^{-1}\}$ E) $\{e^{-1}\}$

7. $A(\widehat{ABC}) = ?$



A) $\frac{1}{2}$

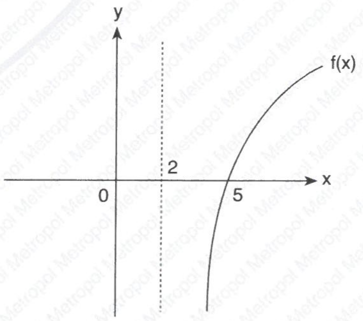
B) 1

C) $\frac{3}{2}$

D) $\frac{1}{4}$

E) $\frac{3}{4}$

8. **f(x) = ?**



A) $-1 + \log_3(x-2)$ B) $-1 + \log_2(x-2)$ C) $1 + \log_2(x-2)$ D) $1 + \log_3(x-2)$ E) $1 + \log_3(x+2)$

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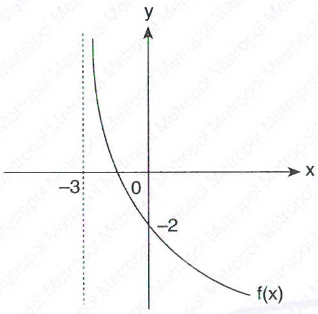
9. $f(x) = \log_a(x + b)$

$\Rightarrow$ **a = ?**



A) $\frac{1}{\sqrt{3}}$

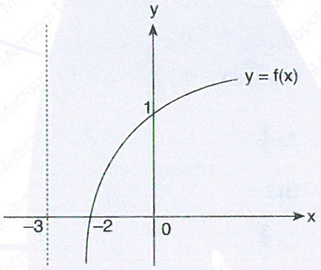
B) $\frac{1}{\sqrt{2}}$

C) $\frac{1}{2}$

D) $\frac{1}{3}$

E) $\frac{1}{4}$

10. **y = f(x) = ?**



A) $\log_3(x + 3)$

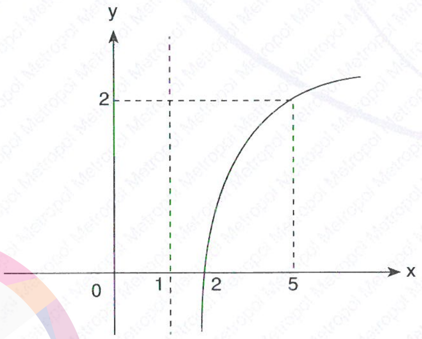
B) $\log_6(x + 2)$

C) $\log_6(x + 3)$

D) $\log_2(x + 3)$

E) $\log_2(x + 2)$

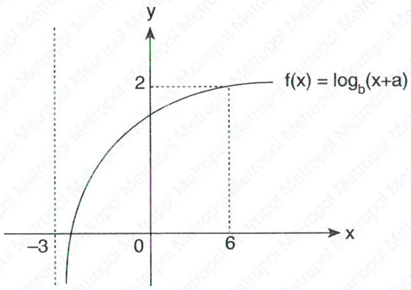
11.



$\Rightarrow$ **f (17) = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

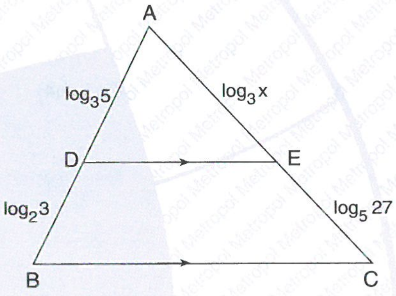
12.



$\Rightarrow$ **f(24) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

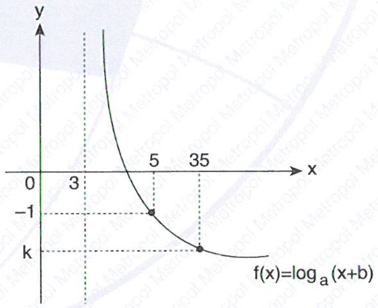
13.



$[DE] \parallel [BC] \Rightarrow$ **x = ?**

A) 12 B) 10 C) 8 D) 6 E) 4

14.



$\Rightarrow$ **k = ?**

A) –3 B) –4 C) –5 D) –6 E) –7

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1	2	3	4	5	6	7
C	D	C	D	B	A	E
8	**9**	**10**	**11**	**12**	**13**	**14**
A	A	A	B	C	C	C

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1. $\log_2(\log x + \log y) = 1 \Rightarrow$ **$x \cdot y = ?$**

A) 10^2 B) 10^{-2} C) 10 D) 10^{-1} E) 10^3

2. $\log_3(x^2 - x) - \log_3 x = 1 \Rightarrow$ **$x = ?$**

A) 4 B) 5 C) 6 D) 36 E) 64

3. $\left.\begin{array}{l} a = \log_3 5 \\ b = \log_9 7 \\ c = \log_3 3 \end{array}\right\} \Rightarrow$ **? < ? < ?**

A) $a < b < c$ B) $a < c < b$

C) $b < c < a$ D) $c < b < a$

E) $c < a < b$

4. $2 \cdot \log_3 x + 3 \cdot \log_3 x^2 + 4 \cdot \log_3 x^3 = 60 \Rightarrow$ **$\log_9 x^3 = ?$**

A) $-\frac{9}{2}$ B) $\frac{9}{2}$ C) 9 D) $\frac{3}{2}$ E) 6

5. $\log_6 3 = a \Rightarrow$ **$\log_3 24 = ?$**

A) $3 + 2a$ B) $3 - 2a$

C) $a \cdot (2a + 3)$ D) $\frac{2a+3}{a}$

E) $\frac{3-2a}{a}$

6. $\left.\begin{array}{l} a = \log 156 \\ b = \log 2 \\ c = \log 3 \end{array}\right\} \Rightarrow$ **$\log 13 = ?$**

A) $a + 2b + c$ B) $a - 2b + c$

C) $a + 2b - c$ D) $a - 2b - c$

E) $-a - 2b - c$

7. $\log_4(x^2 - x - 6) - \log_4(x - 3) = 2 \Rightarrow$ **$x = ?$**

A) 7 B) 14 C) 21 D) 28 E) 35

8. $\log_2(x + 3) + \log_2(x + 11) = 7 \Rightarrow$ **ÇK(SS) = ?**

A) $\{7\}$ B) $\{5\}$ C) $\{3\}$ D) $\{2\}$ E) $\{0\}$

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9. $\ln x - 2\sqrt{\ln x} - 15 = 0 \Rightarrow$ **x = ?**

A) e B) e^5 C) e^{10} D) e^{15} E) e^{25}

10. $(\log x)^2 - \log x - 2 = 0$

$\Rightarrow \sum$ **x = ?**

A) 95 B) 95,1 C) 100 D) 100,1 E) 101

11. $\ln x^2 + \log_x e^3 = 5$, $ÇK(SS) = \{x_1, x_2\}$

$\Rightarrow$ $\mathbf{x_1 \cdot x_2 = ?}$

A) e B) e^2 C) $e^{\frac{5}{2}}$ D) e^3 E) $e^{\frac{7}{2}}$

12. $(\log_5 x)^2 - 2\log_5 x - 3 = 0$, $ÇK(SS) = \{x_1, x_2\}$

$\Rightarrow$ $\mathbf{x_1 \cdot x_2 = ?}$

A) 100 B) 75 C) 50 D) 25 E) 1

13. $e^{2x} - 12e^x + 27 = 0$

$\Rightarrow$ $\mathbf{x_1 + x_2 = ?}$

A) ln27 B) ln9 C) ln3 D) 0 E) −ln27

14. $x \in Z$,

$\log_{\frac{1}{3}}(x-2) - \log_{\frac{1}{3}} 2 \geqslant -2 \Rightarrow \sum$ **x = ?**

A) 197 B) 203 C) 207 D) 211 E) 217

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1	2	3	4	5	6	7
A	A	C	B	E	D	B
8	**9**	**10**	**11**	**12**	**13**	**14**
B	E	D	C	D	A	C

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1. $f(x)=\log_{(x-2)}(5-|x-3|)$

$\Rightarrow \sum x = ?$

A) 22 B) 24 C) 26 D) 28 E) 30

2. $f(x)=\sqrt{3^{\arcsin x}}$

$\Rightarrow f^{-1}(x)=?$

A) $\log_3(2\sin x)$ B) $\sin(\log_3 x)$ C) $\sin(2\cdot\log_3 x)$

D) $\sin^2(\log_3 x)$ E) $\sin(\log_3 2x)$

3. $\log(a^2+3b^2)=\log b+\frac{1}{2}\cdot\log 12+\log a$

$\Rightarrow b=?$

A) $\frac{a}{2}$ B) 2a C) 3a D) $\frac{a}{\sqrt{3}}$ E) $\sqrt{3}\cdot a$

4. $10^{x-2}=5^{x-1} \Rightarrow 20^{\frac{x+2}{x}}=?$

A) 20 B) 40 C) 60 D) 80 E) 160

5. $3\cdot\log_{(5-2\sqrt{3})}\frac{(5+2\sqrt{3})}{13}+2\cdot\log_{(6+2\sqrt{7})}\frac{(6-2\sqrt{7})}{8}=?$

A) −5 B) −3 C) 2 D) 1 E) 5

6. $x\in[0,2\pi]$,

$f(x)=x+\log_x(\cos x) \Rightarrow$ **ÇK(SS) = ?**

A) $\left(0,\frac{\pi}{2}\right)$ B) $\left(0,\frac{\pi}{2}\right)-\{1\}$

C) $\left(0,\frac{\pi}{2}\right)\cup\left(\frac{3\pi}{2},2\pi\right)$ D) $\left[\left(0,\frac{\pi}{2}\right)-\{1\}\right]\cup\left(\frac{3\pi}{2},2\pi\right]$

E) $\left(\frac{3\pi}{2},2\pi\right)$

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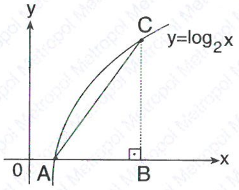
7.



$A(\widehat{ABC}) = 30\ br^2 (u^2)$

$\Rightarrow$ **$C(x_0, y_0) = ?$**

A) (15,3) B) (16,4) C) (18,6) D) (25,5) E) (64,8)

8. $\log_3 x = a,\ \log_3 y = b,\ \log_3 z = c$

$\Rightarrow$ **$\log_3\left(\dfrac{x^3 \cdot \sqrt{y}}{z^2}\right) = ?$**

A) $3a + b - 3c$

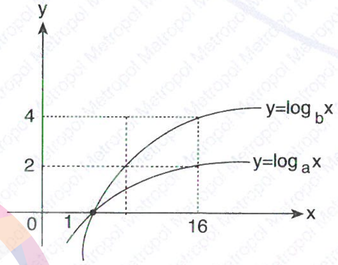
B) $a + \dfrac{b}{2} - 2c$

C) $3a + \dfrac{b}{2} - 2c$

D) $3a + \dfrac{b}{2} + 2c$

E) $3a - \dfrac{b}{2} - 2c$

9.



$\Rightarrow$ **$a + b = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

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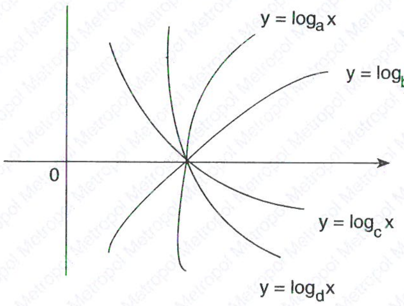
10.



$\Rightarrow$ **? > ? > ? > ?**

A) a > b > d > c

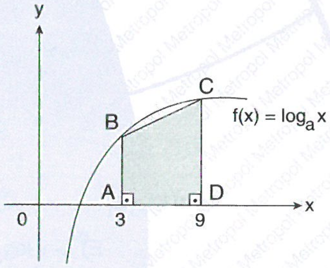
B) b > a > c > d

C) a > b > c > d

D) b > c > d > a

E) b > a > d > c

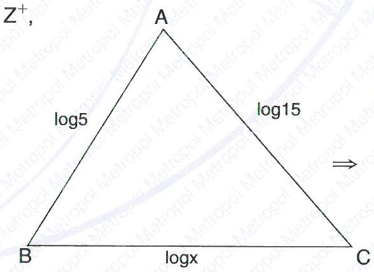
11.



$A(ABCD) = 9\ br^2 (u^2)\ \Rightarrow$ **$f(a^2 + 6a) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $x \in Z^+$,



$\Rightarrow$ **$\prod x = ?$**

A) 74! B) $\dfrac{74!}{2!}$ C) $\dfrac{74!}{3!}$ D) 75! E) $\dfrac{75!}{3!}$

YANITLAR / ANSWERS

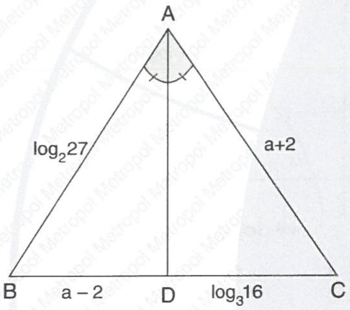
1	2	3	4	5	6	7	8	9	10	11	12
A	C	D	D	A	D	B	C	C	E	C	C

1. $\log 5 = x \Rightarrow \mathbf{\dfrac{\log_3 10}{\log_3 2} = ?}$

A) $1-x$ B) $\dfrac{1}{1-x}$ C) $x-1$ D) $\dfrac{3}{1-x}$ E) $\dfrac{3}{x-1}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

2.



$\Rightarrow$ **a = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

3. $\log_2 7 = x \Rightarrow \mathbf{\log_7 14 = ?}$

A) $x+1$ B) $\dfrac{x-1}{x}$ C) $\dfrac{1}{x+1}$ D) $\dfrac{x}{x+1}$ E) $\dfrac{x+1}{x}$

[ATATÜRK ÜNİVERSİTESİ – YÖS 2018]

4. $f(x) = \log_5 e^{\frac{3}{x}} \Rightarrow \mathbf{f^{-1}(-3) = ?}$

A) $\dfrac{1}{\ln 5}$ B) $\dfrac{3}{\ln 5}$ C) 1 D) $-\dfrac{1}{\ln 5}$ E) $-\dfrac{3}{\ln 5}$

[FIRAT ÜNİVERSİTESİ – YÖS 2018]

5. $\ln a + \ln b = 4$

$\ln a - \ln b = 2 \Rightarrow \mathbf{\log_a b = ?}$

A) $\dfrac{1}{2}$ B) 2 C) 1 D) $\dfrac{1}{3}$ E) $\dfrac{3}{2}$

[ATATÜRK ÜNİVERSİTESİ – YÖS 2018]

6. $a, b \in R^+$,

$\log_4 a + \log_2 b = \dfrac{5}{2}$,

$\log_4 b - \log_2 a = \dfrac{1}{2}$

$\Rightarrow \mathbf{a^3 \cdot b = ?}$

A) 2 B) 8 C) 6 D) 16 E) 3

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

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7. $5^{\log_5[\log_2(3x-7)]} = 1 \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

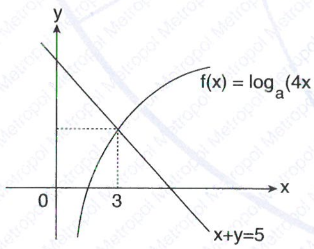
[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

8. $\log_2 x = 5,\ \log_{\sqrt{3}} y = 4 \Rightarrow$ **x + 2y = ?**

A) 50 B) 41 C) 22 D) 78 E) 113

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

9.



$\Rightarrow$ **a = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

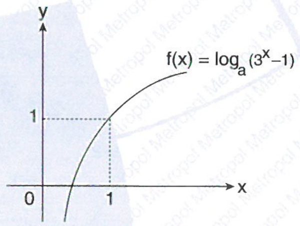
[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

10. $\left.\begin{array}{l}\log_a b = 2\\ \log_b c = 3\\ \log_c d = 4\end{array}\right\} \Rightarrow$ $\mathbf{\log_a(a \cdot b \cdot c \cdot d) = ?}$

A) 26 B) 27 C) 29 D) 30 E) 33

[EGE ÜNİVERSİTESİ – YÖS 2016]

11.



$\Rightarrow$ $\mathbf{\log_a 4^a = ?}$

A) 8 B) 4 C) 2 D) $\frac{1}{2}$ E) $\frac{1}{4}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

12. $\log_5[5 \cdot \log_2 2 \cdot \ln(x+1)] = 1$

$\Rightarrow$ **x = ?**

A) e – 2 B) e – 1 C) e D) e + 1 E) e^2

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
B	B	E	D	D	D	B	A	D	E	B	B

BÖLÜM CHAPTER 9

TARİHSEL NOT / HISTORICAL NOTE

BLAİSE PASCAL [1623 - 1662]

Fransız matematikçi, fizikçi ve düşünürdür. Pascal hayatı boyunca matematiği etkilemeye devam etmiştir. Pascal'ın 1653 yılındaki Traité du triangle arithmétique diye geçen Aritmetik üçgen üzerinde incelemesi, binom çarpanlarını uygun bir tablo halinde tanıtmıştır (Pascal üçgeni).

French mathematician, physicist and thinker. Pascal continued to influence mathematics throughout his life. Pascal's study of the Arithmetic triangle, called "Traité du triangle arithmétique" in 1653, introduced binomial factors as an appropriate table (Pascal's triangle).

TÜMEVARIM, DİZİLER ve SERİLER
INDUCTION, SEQUENCES and SERIES

Bu bölüm 80 alıştırma sorusu, 184 test sorusu, 14 YÖS sorusu içermektedir.

This chapter includes 80 exercise questions, 184 test questions, and 14 YÖS questions.

BÖLÜM / CHAPTER 9

TÜMEVARIM, DİZİLER ve SERİLER / INDUCTION, SEQUENCES and SERIES

- Tümevarım, Diziler ve Seriler / Induction, Sequences and Series .... 249 – 284

TÜMEVARIM, DİZİLER ve SERİLER
INDUCTION, SEQUENCES and SERIES

1. $\sum_{k=1}^{5} 2 = ?$

Yanıt / The Answer is 10

2. $\sum_{k=1}^{10} m = 200 \Rightarrow m = ?$

Yanıt / The Answer is 20

3. $\sum_{k=1}^{6} k = ?$

Yanıt / The Answer is 21

4. $\sum_{k=-4}^{6} 5 = ?$

Yanıt / The Answer is 55

5. $\sum_{k=-2}^{3} k = ?$

Yanıt / The Answer is 3

6. $\sum_{k=-5}^{6} 2k = ?$

Yanıt / The Answer is 12

7. $\sum_{n=1}^{10} (n^2 - 3n - 4) = ?$

Yanıt / The Answer is 180

8. $\sum_{i=1}^{6} (xi + 2) = 75 \Rightarrow x = ?$

Yanıt / The Answer is 3

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9. $\sum_{k=-2}^{6} (7k-1) = ?$

Yanıt / The Answer is 117

10. $\sum_{k=-2}^{4} (5-xk) = 49 \Rightarrow x = ?$

Yanıt / The Answer is –2

11. $\sum_{k=1}^{10} k \cdot (k+1) = ?$

Yanıt / The Answer is 440

12. $\sum_{k=0}^{8} (k+1)^2 = ?$

Yanıt / The Answer is 285

13. $\sum_{k=4}^{123} \log_5\left(\frac{k+2}{k+1}\right) = ?$

Yanıt / The Answer is 2

14. $13 + 15 + 17 + ... + 91 = ?$

Yanıt / The Answer is $\sum_{k=7}^{46} (2k-1)$

15. $(-28) + (-26) + ... + 0 + ... + 26 + 28 = ?$

Yanıt / The Answer is $\sum_{k=-14}^{14} 2k$

16. $\sum_{m=-2}^{5} (3m+k) = 124 \Rightarrow k = ?$

Yanıt / The Answer is 11

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17. $x_1 = 2,\ x_2 = -3$

$\Rightarrow \sum_{k=1}^{2} x_k = ?$

Yanıt / The Answer is –1

18. $f(x) = 5x + 6 \Rightarrow \sum_{k=1}^{3} f(k) = ?$

Yanıt / The Answer is 48

19. $\sum_{k=1}^{3} \sum_{n=1}^{4} (3n - 2k) = ?$

Yanıt / The Answer is 42

20. $\sum_{k=1}^{4} \sum_{p=1}^{3} \sum_{t=1}^{2} (k \cdot p \cdot t) = ?$

Yanıt / The Answer is 180

21. $f(x) = x^2 - 5x + 6,\ f(x_1) = f(x_2) = 0$

$\Rightarrow \sum_{k=1}^{2} (x_k + 1) \cdot (x_k + 2) = ?$

Yanıt / The Answer is 32

22. $\sum_{k=1}^{5} \left(\frac{1}{k} - \frac{1}{k+1}\right) = ?$

Yanıt / The Answer is $\frac{5}{6}$

23. $\sum_{k=1}^{5} (-1)^k \cdot (k+1) = ?$

Yanıt / The Answer is –4

24. $\sum_{k=0}^{260} k! = A,$ $\quad A \div 30$ işleminde kalan m $\Rightarrow$ m=?

Yanıt / The Answer is 4

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25. $f(x)=\sum_{k=1}^{x} k!,\ g(x)=\sum_{k=1}^{x}(k+1)$

$\Rightarrow (gof)(2)=?$

Yanıt / The Answer is 9

26. $\sum_{p=0}^{7}\binom{7}{p}=?$

Yanıt / The Answer is 2^7

27. $\prod_{k=1}^{6} 2=?$

Yanıt / The Answer is 2^6

28. $\prod_{k=0}^{12} 4=?$

Yanıt / The Answer is 2^{26}

29. $\prod_{k=1}^{10} k=?$

Yanıt / The Answer is 10!

30. $\prod_{k=10}^{25} k=?$

Yanıt / The Answer is $\frac{25!}{9!}$

31. $\prod_{k=1}^{8}(k^2+k)=?$

Yanıt / The Answer is $8!\cdot 9!$

32. $\prod_{k=1}^{17}\frac{k}{k+1}=?$

Yanıt / The Answer is $\frac{1}{18}$

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33. $\prod_{k=1}^{6}(k^2-k-6)=?$

Yanıt / The Answer is 0

34. $\prod_{k=1}^{11}(2k^2-7k-4)=?$

Yanıt / The Answer is 0

35. $\prod_{k=2}^{5}2^{k-2}=?$

Yanıt / The Answer is 64

36. $\prod_{m=-1}^{5}2^{m+1}=?$

Yanıt / The Answer is 2^{21}

37. $\prod_{k=1}^{30}\log_{(k+1)}(k+2)=?$

Yanıt / The Answer is 5

38. $\prod_{k=5}^{12}\left(1+\frac{1}{k}\right)=?$

Yanıt / The Answer is $\frac{13}{5}$

39. $\prod_{k=1}^{n}5^{\frac{k}{3}}=5^5 \Rightarrow n=?$

Yanıt / The Answer is 5

40. $\prod_{k=1}^{5}2^{2k-1}=2^x \Rightarrow x=?$

Yanıt / The Answer is 25

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41. $\prod_{n=1}^{2} \sum_{m=1}^{4} (m+n) = ?$

Yanıt / The Answer is 252

42. $\sum_{k=1}^{5} \prod_{m=1}^{2} (m+k) = ?$

Yanıt / The Answer is 110

43. $\prod_{k=1}^{10} \left(1+\frac{1}{k+2}\right) = ?$

Yanıt / The Answer is $\frac{13}{3}$

44. $\prod_{k=1}^{20} \left(1+\frac{1}{k+1}\right)^2 = ?$

Yanıt / The Answer is 121

45. $\prod_{k=1}^{15} \left(1+\frac{2k+1}{k^2}\right) = ?$

Yanıt / The Answer is 256

46. $\prod_{k=1}^{20} \left(1+\frac{2}{k}+\frac{1}{k^2}\right) = ?$

Yanıt / The Answer is 441

47. $\prod_{k=1}^{4} (3k+1) \equiv x \pmod{91} \Rightarrow x = ?$

Yanıt / The Answer is 0

48. $f: N^+ \to N^+$,

$f(x) = \prod_{n=1}^{x} 2^n \Rightarrow (fof)(2) = ?$

Yanıt / The Answer is 2^{36}

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49. $(a_n)=(4n+5) \Rightarrow \mathbf{a_2+a_4=?}$

Yanıt / The Answer is **34**

50. $(a_n)=(n^2+8n+16) \Rightarrow \mathbf{a_9=?}$

Yanıt / The Answer is **169**

51. $(a_n)=\left(\sum_{k=1}^{n}(2k-1)\right) \Rightarrow \mathbf{a_8=?}$

Yanıt / The Answer is **64**

52. $(a_n)=\left(\frac{2^n}{n!}\right) \Rightarrow \mathbf{\frac{a_6}{a_4}=?}$

Yanıt / The Answer is $\mathbf{\frac{2}{15}}$

53. $(a_n)=\left(\frac{1}{n}+\frac{3}{n}+\frac{5}{n}+\ldots+\frac{2n-1}{n}\right)$
$\Rightarrow \mathbf{a_{10}=?}$

Yanıt / The Answer is **10**

54. $(a_n)=(3n-1),\ a_k=20 \Rightarrow \mathbf{k=?}$

Yanıt / The Answer is **7**

55. $(a_n)=\left(\frac{5n+4}{2n-5}\right),\ a_k=8 \Rightarrow \mathbf{k=?}$

Yanıt / The Answer is **4**

56. $(a_n)=\begin{cases} n-1, & n\equiv 0(\mathrm{mod}\,2) \\ -n^2, & n\equiv 1(\mathrm{mod}\,2)\end{cases} \Rightarrow \mathbf{a_6+a_7=?}$

Yanıt / The Answer is **–44**

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57. $(a_n) = \begin{cases} n^2-1, & n \equiv 0(\text{mod}\,3) \\ \dfrac{2n-1}{2}, & n \equiv 1(\text{mod}\,3) \\ -n, & n \equiv 2(\text{mod}\,3) \end{cases} \Rightarrow a_3 + a_7 + a_{11} = ?$

Yanıt / The Answer is $\frac{7}{2}$

58. $(a_n) = \begin{cases} 2n+1, & n \equiv 0(\text{mod}\,3) \\ 2, & n \equiv 1(\text{mod}\,3) \\ 3n, & n \equiv 2(\text{mod}\,3) \end{cases} \Rightarrow a_7 + a_8 + a_9 = ?$

Yanıt / The Answer is 45

59. $(a_n) = \left(\sum_{k=1}^{n} 2k \right) \Rightarrow a_4 = ?$

Yanıt / The Answer is 20

60. $(a_n) = \left(\sum_{k=1}^{n} k^2 \right) \Rightarrow a_6 = ?$

Yanıt / The Answer is 91

61. $(a_n) = (3n+7) \Rightarrow (a_{n+1}) = ?$

Yanıt / The Answer is $(3n+10)$

62. $(a_{n+1}) = (5n-2) \Rightarrow (a_n) = ?$

Yanıt / The Answer is $(5n-7)$

63. $(a_n) = \left(\dfrac{2n-1}{n+3} \right) \Rightarrow (a_{2n-1}) = ?$

Yanıt / The Answer is $\left(\dfrac{4n-3}{2n+2} \right)$

64. $(a_{2n+1}) = (4n^2 + 4n + 1) \Rightarrow (a_n) = ?$

Yanıt / The Answer is (n^2)

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65. $\sum_{n=1}^{\infty}\left(\frac{1}{2}\right)^{n-1} = ?$

Yanıt / The Answer is 2

66. $\sum_{n=0}^{\infty}\left(\frac{5}{2}\right)^{-n} = ?$

Yanıt / The Answer is $\frac{5}{3}$

67. $\sum_{n=1}^{\infty} 3^{-n+1} = ?$

Yanıt / The Answer is $\frac{3}{2}$

68. $\sum_{n=2}^{\infty}\left(\frac{4}{3}\right)^{-n+1} = ?$

Yanıt / The Answer is 3

69. $\sum_{n=1}^{\infty}\left(\frac{3}{7}\right)^{n-1} = ?$

Yanıt / The Answer is $\frac{7}{4}$

70. $\sum_{k=1}^{\infty} 5^{-k} = ?$

Yanıt / The Answer is $\frac{1}{4}$

71. $\sum_{n=0}^{\infty} 3^{-2n} = ?$

Yanıt / The Answer is $\frac{9}{8}$

72. $\sum_{n=1}^{\infty} \frac{2^{n+1}}{5^{n}} = ?$

Yanıt / The Answer is $\frac{4}{3}$

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73. $\sum_{n=0}^{\infty}(2^{-n}+4^{-n})=?$

Yanıt / The Answer is $\frac{10}{3}$

74. $\sum_{n=2}^{\infty}(1{,}25)^{-n}=?$

Yanıt / The Answer is $\frac{16}{5}$

75. $\prod_{n=1}^{\infty}3^{\left(\frac{1}{3}\right)^n}=?$

Yanıt / The Answer is $\sqrt{3}$

76. $0{,}3+0{,}03+0{,}003+\ldots=?$

Yanıt / The Answer is $\frac{1}{3}$

77. $0{,}36+0{,}0036+0{,}000036+\ldots=?$

Yanıt / The Answer is $\frac{4}{11}$

78. $\sum_{n=1}^{\infty}\frac{1-3^n}{5^n}=?$

Yanıt / The Answer is $-\frac{5}{4}$

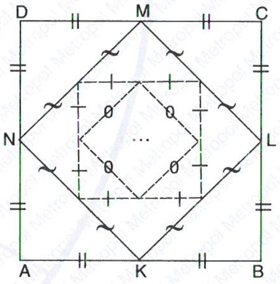
79. ABCD bir karedir.

ABCD is a square.

|AB| = 10 cm

⇒ **Toplam alan/**

The total area = ? br² (u²)



Yanıt / The Answer is **200**

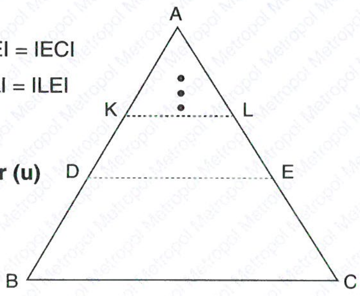
80. |AB| = |AC| = |BC| = 6

|AD| = |DB| ve (and) |AE| = |EC|

|AK| = |KD| ve (and) |AL| = |LE|

⇒ **Toplam çevre /**

The total perimeter = ? br (u)



Yanıt / The Answer is **36**

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1. $\sum_{k=1}^{20} k = ?$

A) 150 B) 170 C) 190 D) 210 E) 230

2. $\sum_{k=1}^{n} (-k) = -28 \Rightarrow n = ?$

A) 7 B) 6 C) 5 D) 4 E) 3

3. $\sum_{k=1}^{16} (2k+3) = ?$

A) 306 B) 312 C) 314 D) 318 E) 320

4. $\sum_{k=1}^{15} (2-k) = ?$

A) –120 B) –90 C) –68 D) –60 E) –44

5. $\sum_{k=5}^{17} (7k-5) = ?$

A) 930 B) 936 C) 946 D) 954 E) 962

6. $\sum_{k=2}^{12} (2k+1) = ?$

A) 165 B) 160 C) 145 D) 140 E) 115

7. $\sum_{n=1}^{20} (n+2) = ?$

A) 250 B) 332 C) 420 D) 432 E) 440

8. $\sum_{n=1}^{20} (2+na) = 70 \Rightarrow a = ?$

A) $\frac{1}{5}$ B) $\frac{1}{6}$ C) $\frac{1}{7}$ D) $\frac{1}{8}$ E) $\frac{1}{9}$

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9. $\sum_{k=7}^{n}(k+3)=46 \Rightarrow$ **n = ?**

A) 7 B) 9 C) 10 D) 12 E) 14

10. $\sum_{k=0}^{5}(2ak-5)=60 \Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

11. $\sum_{k=1}^{3} 3\cdot(-k^2)=?$

A) –12 B) –22 C) –32 D) –42 E) –52

12. $\sum_{k=0}^{8}(k^2-1)=?$

A) 194 B) 195 C) 204 D) 210 E) 215

13. $\sum_{k=1}^{10}(k^2+3k+1)=?$

A) 550 B) 555 C) 560 D) 565 E) 570

14. $\sum_{k=1}^{12} k^3=?$

A) 3042 B) 6084 C) 4042 D) 6082 E) 6086

15. $\sum_{k=-9}^{10}(k^3-k)=?$

A) 1010 B) 990 C) 910 D) 900 E) 890

16. $1+4+7+10+\ldots+130=?$

A) $\sum_{k=1}^{15} k^2$ B) $\sum_{k=0}^{30}(3k+1)$ C) $\sum_{k=1}^{10} k^3$

D) $\sum_{k=0}^{43}(3k+1)$ E) $\sum_{k=0}^{15}(3k-1)$

METROPOL YAYINLARI • METROPOL PUBLICATIONS

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	A	E	B	B	A	A	C
9	10	11	12	13	14	15	16
C	C	D	B	C	B	B	D

1. $\sum_{k=1}^{30} 3k = ?$

A) 1195 B) 1295 C) 1395 D) 1495 E) 1595

2. $\sum_{k=3}^{12} 2k = ?$

A) 150 B) 100 C) 50 D) 25 E) 5

3. $\sum_{k=1}^{12} (2k-1) = ?$

A) 48 B) 60 C) 72 D) 84 E) 144

4. $\sum_{n=4}^{8} (3n+m) = 5! \Rightarrow m = ?$

A) 2 B) 5 C) 6 D) 8 E) 9

5. $\sum_{k=1}^{x} (10-k) = -21 \Rightarrow x = ?$

A) –3 B) –7 C) –14 D) 21 E) –21

6. $\sum_{k=p}^{n} (k-p) = 15 \Rightarrow n-p = ?$

A) 5 B) 10 C) 15 D) 20 E) 25

7. $\sum_{i=1}^{12} i^2 = ?$

A) 300 B) 350 C) 400 D) 450 E) 650

8. $\sum_{k=1}^{a} (k^2 - a \cdot k) = -4 \Rightarrow a = ?$

A) 3 B) 6 C) 9 D) 12 E) 15

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9. $\sum_{k=1}^{5}(k^2+2k-3)=?$

A) 50 B) 55 C) 60 D) 65 E) 70

10. $\sum_{n=2}^{9}(n^2-2n+1)=?$

A) 144 B) 148 C) 154 D) 204 E) 248

11. $\sum_{n=2}^{11}(n-3)^2=?$

A) 205 B) 203 C) 201 D) 199 E) 197

12. $f(x)=\sum_{k=1}^{x}(k^2+m\cdot k),\ f(1)=4\ \Rightarrow\ f(2)=?$

A) 28 B) 14 C) 7 D) 1 E) –14

13. $\sum_{n=1}^{20}\frac{1}{(n+1)(n+2)}=?$

A) $\frac{5}{11}$ B) $\frac{4}{11}$ C) $\frac{3}{11}$ D) $\frac{2}{11}$ E) $\frac{1}{11}$

14. $\sum_{k=1}^{4}k\cdot(k+1)^2=?$

A) 130 B) 140 C) 150 D) 160 E) 170

15. $\sum_{k=1}^{30}(-1)^k\cdot(2k+3)=?$

A) 10 B) 20 C) 30 D) 40 E) 50

16. $\sum_{n=1}^{21}(-1)^n\cdot(3n+1)=?$

A) –17 B) –34 C) –51 D) –68 E) –85

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	A	E	C	D	A	E	A
9	10	11	12	13	14	15	16
E	D	A	B	A	E	C	B

1. $\sum_{k=2}^{6} (k-2)\cdot(k-3)\cdot(k-4) = ?$

A) 25 B) 28 C) 30 D) 56 E) 60

2. $\sum_{k=-8}^{3} (k^2+18k) = ?$

A) –97 B) –124 C) –137 D) –284 E) –322

3. $\sum_{k=-5}^{5} k\cdot(k^2+5) = ?$

A) –5 B) –3 C) 0 D) 3 E) 5

4. $\sum_{k=-10}^{10} (k^3-2k+1) = ?$

A) 17 B) 18 C) 19 D) 20 E) 21

5. $\sum_{k=-4}^{4} (k+2)\cdot(k^2-2k+4) = ?$

A) 45 B) 60 C) 72 D) 76 E) 84

6. $\sum_{k=0}^{18} \frac{1}{(k+1)(k+2)} = ?$

A) $\frac{16}{19}$ B) $\frac{17}{19}$ C) $\frac{18}{19}$ D) $\frac{17}{20}$ E) $\frac{19}{20}$

7. $\sum_{k=3}^{27} \frac{1}{k^2+5k+6} = ?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{5}$ D) $\frac{1}{6}$ E) $\frac{1}{12}$

8. $\sum_{k=0}^{8} 2^k = ?$

A) 240 B) 256 C) 358 D) 480 E) 511

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9. $i^2=-1 \Rightarrow \sum_{k=2}^{100} i^k = ?$

A) – i B) – 1 C) 0 D) 1 E) i

10. $\sum_{n=0}^{100} 3^n \equiv x(\text{mod}5) \Rightarrow x = ?$

A) 5 B) 3 C) 1 D) 0 E) 2

11. $\sum_{k=1}^{10} k \cdot k! = ?$

A) 10! B) 10! –1 C) 11! D) 11! –1 E) 12!

12. $\sum_{k=1}^{20} k \cdot k! = ?$

A) 20! B) 21! C) 20! –1 D) 21! +1 E) 21! –1

13. $\sum_{k=5}^{124} \log_5\left(1-\frac{1}{k+1}\right) = ?$

A) –2 B) –1 C) 1 D) 2 E) 3

14. $\sum_{x=1}^{2}\sum_{y=1}^{3}(x^2+y^2) = ?$

A) 41 B) 43 C) 47 D) 53 E) 57

15. $\sum_{n=2}^{6}\sum_{k=3}^{6}(k+n-2) = ?$

A) 120 B) 128 C) 130 D) 132 E) 140

16. $\sum_{n=1}^{4}\sum_{m=2}^{3}[m^2n-6n] = ?$

A) 30 B) 20 C) 10 D) –10 E) –20

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	E	C	E	C	E	D	E
9	10	11	12	13	14	15	16
A	C	D	E	A	B	C	C

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1. $\sum_{k=3}^{5} k + \sum_{k=6}^{9} k + \sum_{k=10}^{13} k = ?$

A) 84 B) 88 C) 92 D) 96 E) 100

2. $\sum_{k=1}^{n+3} (2k-3) = an^2 + bn + c \Rightarrow \mathbf{a + b + c = ?}$

A) 4 B) 8 C) 12 D) 16 E) 20

3. $\sum_{k=1}^{n+8} (8k-18) = an^2 + 2 \cdot b \cdot n + 144 \Rightarrow \mathbf{a + b = ?}$

A) 29 B) 27 C) 25 D) 23 E) 21

4. $\sum_{k=1}^{n} k^2 + \sum_{k=1}^{n} k = 112 \Rightarrow \mathbf{n = ?}$

A) 6 B) 3 C) 1 D) 2 E) 5

5. $\sum_{k=-2}^{8} \frac{1}{(k+3)\cdot(k+4)} = ?$

A) $\frac{5}{12}$ B) $\frac{7}{12}$ C) $\frac{9}{12}$ D) $\frac{11}{12}$ E) $\frac{13}{12}$

6. $f(x) = x + 2 \Rightarrow \sum_{n=1}^{8} (f(n))^2 = ?$

A) 300 B) 340 C) 380 D) 350 E) 400

7. $f(x) = 3x - 2;\ x_1 = 2,\ x_2 = 3$

$\Rightarrow \sum_{k=1}^{2} ((x_k + 4) \cdot f(x_k)) = ?$

A) 70 B) 73 C) 76 D) 79 E) 82

8. $f(x) = 3x - 1$ ve (and) $x_1 = 3,\ x_2 = 5,\ x_3 = 7$

$\Rightarrow \sum_{i=1}^{3} ((x_i - 2) \cdot f(x_i)) = ?$

A) 100 B) 150 C) 90 D) 180 E) 160

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9. $\sum_{x=1}^{18} (\tan x \cdot \cot x) = ?$

A) 36 B) 18 C) 1 D) –18 E) – 36

10. $\sum_{k=1}^{89} (\tan k^\circ - \cot k^\circ) = ?$

A) – 89 B) – 1 C) 0 D) 1 E) 89

11. $3^3 + 4^3 + 5^3 + ... + x^3 = 2016$

$\Rightarrow$ **x = ?**

A) 27 B)18 C) 9 D) 1 E) – 9

12. $\sum_{k=-5}^{6} k^3 = ?$

A) 8 B) 64 C) 27 D) 125 E) 216

13. $\sum_{k=1}^{4} k^3 + \sum_{k=6}^{10} k^3 - 4 = ?$

A) 2900 B) 2896 C) 2892 D) 2884 E) 2880

14. $\sum_{n=1}^{5} \left(\frac{1}{2}\right)^n = ?$

A) $\frac{31}{32}$ B) $\frac{32}{31}$ C) $\frac{5}{32}$ D) $\frac{32}{5}$ E) $\frac{5}{31}$

15. $\sum_{i=1}^{6} \left(\sum_{i=2}^{5} (2i+1) \right) = ?$

A) 190 B) 191 C) 192 D) 193 E) 194

16. $z = 1 + i,\ (i^2 = -1) \Rightarrow \sum_{i=1}^{12} (1-z) \cdot z = ?$

A) – 60 B) – 66 C) – 72 D) – 84 E) – 96

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	B	A	A	D	C	B	B
9	10	11	12	13	14	15	16
B	C	C	E	B	A	C	B

1. $\prod_{k=1}^{3} 2 + \prod_{n=0}^{5} 3n + \prod_{m=1}^{4} m = ?$

A) 24 B) 26 C) 30 D) 32 E) 36

2. $\prod_{k=1}^{15} \frac{k}{k+1} = ?$

A) $\frac{1}{16}$ B) $\frac{1}{15}$ C) $\frac{1}{12}$ D) $\frac{1}{8}$ E) $\frac{1}{4}$

3. $\prod_{k=5}^{m} \left(\frac{k+4}{k+3}\right) = 7 \Rightarrow m = ?$

A) 50 B) 52 C) 54 D) 56 E) 58

4. $\prod_{k=3}^{10} \left(1 - \frac{1}{k}\right) = ?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

5. $\prod_{k=4}^{1900} \left(1 - \frac{10}{k}\right) = ?$

A) 4 B) 3 C) 0 D) 10 E) 20

6. $\prod_{k=1}^{10} \left(1 + \frac{1}{k+1}\right) = ?$

A) 4 B) 5 C) 6 D) 8 E) 10

7. $\prod_{n=1}^{18} \left(1 + \frac{1}{n+5}\right) = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

8. $\prod_{k=1}^{6} 2^k = ?$

A) 2^7 B) 2^{14} C) 2^{21} D) 2^{28} E) 2^{35}

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9. $\prod_{n=1}^{7} 3^{2n-3} = 3^x \Rightarrow x = ?$

A) 27 B) 30 C) 33 D) 35 E) 36

10. $\prod_{k=-5}^{7} (k^2-6k+9) = ?$

A) –21 B) –14 C) 0 D) 14 E) 21

11. $\prod_{k=1}^{10} (k^2-6k+9) = ?$

A) 1210 B) 1080 C) 976 D) 940 E) 0

12. $\prod_{k=3}^{8} (k^2-6k-16) = ?$

A) – 48 B) – 24 C) 0 D) 24 E) 48

13. $\prod_{k=1}^{20} \left(\frac{k^2-k-6}{k^2-2k+3}\right) = ?$

A) 0 B) $\frac{10}{7}$ C) $\frac{13}{2}$ D) 11 E) $\frac{22}{13}$

14. $\prod_{k=2}^{31} \log_{(k)}(k+1) = ?$

A) 5 B) 6 C) 7 D) 8 E) 10

15. $\prod_{k=3}^{80} \log_{(k+1)}(k) = ?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 3 E) 4

16. $f(x) = 2x-1 \Rightarrow \prod_{k=1}^{4} f(k) = ?$

A) 85 B) 87 C) 95 D) 100 E) 105

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	A	B	D	C	C	C	C
9	10	11	12	13	14	15	16
D	C	E	C	A	A	A	E

1. $\prod_{k=1}^{n} 3^{k+3} = 3^{15} \Rightarrow$ **n = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

2. $\prod_{k=1}^{8} \left(\frac{2}{3}\right)^{k} = \left(\frac{27}{8}\right)^{x} \Rightarrow$ **k = ?**

A) –12 B) –9 C) –3 D) 9 E) 12

3. $\prod_{k=1}^{45} \sqrt{\frac{k+2}{k+3}} = ?$

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

4. $f(x) = 2x - 1,\ g(x) = x + 1$

$\Rightarrow \prod_{k=1}^{3} [f(k) \cdot g(k)] = ?$

A) 2!·3! B) 5! C) 2·5! D) 3·5! E) 6!

5. $f(x) = \prod_{k=1}^{x} k,\ g(x) = \prod_{k=-2}^{x} (k+3)$

$\Rightarrow$ **(fog)(0) = ?**

A) 6 B) 24 C) 120 D) 540 E) 720

6. $x^2 - 4x + m - 5 = 0$, ÇK(SS) = $\{x_1, x_2\}$,

$\prod_{k=1}^{2} x_k = 8 \Rightarrow$ **m = ?**

A) 8 B) 10 C) 12 D) 13 E) 15

7. $\prod_{x=30}^{120} \cos x^{\circ} = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) $\frac{\sqrt{3}}{2}$

8. $\prod_{k=1}^{89} \tan k^{\circ} = ?$

A) 1 B) $\frac{1}{\sqrt{2}}$ C) $-\frac{1}{\sqrt{2}}$ D) –1 E) 0

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9. $\prod_{x=1}^{90} (\sin 2x) = ?$

A) – 1 B) 0 C) $\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$ E) 1

10. $i^2 = -1 \Rightarrow \prod_{k=1}^{20} i = ?$

A) –i B) –1 C) 0 D) 1 E) i

11. $\log_3\left(\prod_{k=1}^{n} 3^k\right) = 28 \Rightarrow n = ?$

A) 6 B) 7 C) 9 D) 12 E) 14

12. $\prod_{k=2}^{121} \log_{(k+3)}{(k+4)} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

13. $\log_5\left(\prod_{k=7}^{10} 25\right) = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

14. $\prod_{k=1}^{18} 2^{\log\left(\frac{k+1}{k+2}\right)} = ?$

A) $-\frac{1}{2}$ B) 2 C) $\frac{1}{2}$ D) 2^2 E) 2^4

15. $\sum_{n=1}^{10} \prod_{m=2}^{8} (m \cdot n - 3n) = ?$

A) –726 B) –363 C) 0 D) 363 E) 726

16. $\prod_{n=1}^{a} \sum_{k=1}^{n} \left(\frac{1}{k \cdot (k+1)}\right) = ?$

A) $\frac{1}{a-1}$ B) $\frac{1}{a}$ C) $\frac{1}{a+1}$ D) $\frac{1}{2a}$ E) $\frac{1}{2a+2}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	A	C	D	E	D	C	A
9	10	11	12	13	14	15	16
B	B	B	B	E	C	C	C

1. $\sum_{k=1}^{10} \prod_{m=2}^{3} (m+k-2) = ?$

A) 350 B) 360 C) 380 D) 420 E) 440

2. $\sum_{k=3}^{82} \prod_{n=1}^{19} \left(1-\frac{1}{n+1}\right) = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

3. $\prod_{k=-2}^{5} \sum_{n=1}^{3} (nk-2) = ?$

A) –12 B) –6 C) 0 D) 6 E) 12

4. $\sum_{n=4}^{9} \prod_{k=1}^{n} \frac{k+1}{k} = ?$

A) 45 B) 48 C) 50 D) 52 E) 54

5. $\sum_{m=1}^{2} \prod_{k=2}^{3} (m \cdot k^m) = ?$

A) 150 B) 162 C) 180 D) 192 E) 196

6. $i^2 = -1$,

$\sum_{m=-2}^{3} \prod_{n=1}^{21} i^n = ?$

A) –6i B) –3i C) –i D) 3i E) 6i

7. $\prod_{k=4}^{8} \sum_{m=2}^{4} m \cdot (m-3) = ?$

A) 8 B) 16 C) 32 D) 64 E) 128

8. $\sum_{k=0}^{3} (2^k - k!) = x \Rightarrow \prod_{n=3}^{5} x = ?$

A) 25 B) 32 C) 64 D) 125 E) 128

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9. $i^2 = -1$,

$$\sum_{k=1}^{73} i^k = x \Rightarrow \prod_{n=1}^{15} x^n = ?$$

A) –i B) –1 C) 0 D) 1 E) i

10. $f: x \to \sum_{k=1}^{x} k, \; g: x \to \prod_{k=1}^{x} k$

$$\Rightarrow (gof)(2) = ?$$

A) 6 B) 5 C) 4 D) 3 E) 2

11. $x^2 + 6x - 5 = 0$, ÇK(SS) = $\{x_1, x_2\}$

$$\Rightarrow \prod_{k=1}^{2} 4x_k + \sum_{k=1}^{2} (3 - x_k) = ?$$

A) –80 B) –68 C) –40 D) 40 E) 80

12. $f(n) = \begin{cases} n-5, & n \equiv 0 \pmod 3 \\ \dfrac{n}{n-1}, & n \equiv 1 \pmod 3 \\ n, & n \equiv 2 \pmod 3 \end{cases}$

$$\Rightarrow \sum_{k=2}^{6} 3 \cdot f(k) = ?$$

A) 11 B) 18 C) 22 D) 24 E) 27

13. $\sum_{n=0}^{46} n! \equiv x \pmod 5 \Rightarrow x = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

14. $\sum_{k=-2}^{33} (k+2) \equiv x \pmod 9 \Rightarrow x = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

15. $\sum_{k=m}^{n+m} m = 7n + 7 \Rightarrow \sum_{k=1}^{m} k = ?$

A) 6 B) 8 C) 9 D) 28 E) 32

16. $\prod_{m=1}^{2} \sum_{n=3}^{5} \left(\frac{m \cdot n - 5}{2m}\right) = x^3 \Rightarrow x = ?$

A) $-\frac{1}{2}$ B) –1 C) $-\frac{3}{2}$ D) – 2 E) $-\frac{5}{2}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	D	C	A	A	A	C	D
9	10	11	12	13	14	15	16
D	A	B	C	E	A	D	C

1. $2011-2010+2009-2008+...+3-2+1=?$

A) 1004 B) 1008 C) 1000 D) 1006 E) 1002

2. $a_n=\begin{cases}3n+3, & n\equiv 0\ (\text{mod}3)\\ 2n+5, & n\equiv 1(\text{mod}3)\\ 3n^2+n, & n\equiv 2(\text{mod}3)\end{cases}$

$\Rightarrow a_5+a_7+a_9=?$

A) 130 B) 129 C) 128 D) 127 E) 126

3. $a_n=\begin{cases}-5n, & n\equiv 0(\text{mod}2)\\ \dfrac{n^2-3}{n+1}, & n\equiv 1(\text{mod}2)\end{cases}$

$\Rightarrow a_4+a_7=?$

A) $-\frac{43}{8}$ B) $-\frac{41}{8}$ C) $-\frac{57}{8}$ D) $-\frac{41}{4}$ E) $-\frac{57}{4}$

4. $a_n=\begin{cases}3^n, & n\equiv 0(\text{mod}3)\\ 3n-1, & n\equiv 1(\text{mod}3)\\ \dfrac{2n+3}{5}, & n\equiv 2(\text{mod}3)\end{cases}$

$\Rightarrow a_3+a_{10}+a_{11}=?$

A) 50 B) 51 C) 60 D) 61 E) 62

5. $a_n=\begin{cases}2^n+1, & n\equiv 0(\text{mod}2)\\ 2^n-1, & n\equiv 1(\text{mod}2)\end{cases}$

$\Rightarrow \dfrac{a_9-a_7}{a_8-4a_6}=?$

A) -2^8 B) -2^7 C) -2^6 D) $1-2^5$ E) $1-2^4$

6. $a_k=\begin{cases}k^2+1, & k=2n-1\\ \dfrac{k}{k-3}, & k=2n\end{cases} \Rightarrow a_5\cdot a_6=?$

A) 50 B) 52 C) 54 D) 56 E) 60

7. $a_n=\begin{cases}0, & n\equiv 0(\text{mod}3)\\ n, & n\equiv 1(\text{mod}3)\\ -n, & n\equiv 2(\text{mod}3)\end{cases}$

$b_n=\sum_{k=0}^{n} a_k$

$\Rightarrow b_4=?$

A) –2 B) –1 C) 0 D) 2 E) 3

8. $(a_n)=\dfrac{1}{n!} \Rightarrow \dfrac{a_5}{a_6}=?$

A) $-\frac{1}{5}$ B) $\frac{1}{6}$ C) $\frac{1}{8}$ D) 5 E) 6

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9. $a_n = a_{n-1} \cdot (n-1),\ a_1 = 1$

$\Rightarrow$ $\mathbf{a_3 = ?}$

A) 1 B) 2 C) 6 D) 9 E) 24

10. $(a_n) = 2 \cdot (a_{n-1}),$

$a_1 = 5 \Rightarrow \mathbf{a_5 = ?}$

A) 40 B) 48 C) 64 D) 72 E) 80

11. $a_{n+1} = a_n + \frac{2}{n},\ a_1 = 2$

$\Rightarrow$ $\mathbf{a_4 = ?}$

A) $\frac{8}{3}$ B) 4 C) $\frac{14}{3}$ D) 5 E) $\frac{17}{3}$

12. $a_1 = 7,\ a_{n+1} = a_n + 2n \Rightarrow \mathbf{a_4 = ?}$

A) 17 B) 19 C) 21 D) 23 E) 25

13. $a_1 = 40,$

$a_{k+1} = a_k - k \ (k = 1, 2, 3, \ldots)$

$\Rightarrow$ $\mathbf{a_8 = ?}$

A) 4 B) 7 C) 12 D) 15 E) 19

14. $a_{n+1} = \frac{n}{n+1} \cdot a_n,\ a_1 = 2$

$\Rightarrow$ $\mathbf{a_{10} = ?}$

A) $\frac{1}{3}$ B) $\frac{1}{5}$ C) $\frac{2}{5}$ D) $\frac{3}{5}$ E) $\frac{2}{3}$

15. $a_{n+1} = a_n + 2n - 1,\ a_3 = 5$

$\Rightarrow$ $\mathbf{a_{23} = ?}$

A) 485 B) 490 C) 495 D) 500 E) 505

16. $n \geq 1,$

$an = \sum_{k=1}^{n} \frac{1}{k(k+1)} \Rightarrow \mathbf{a_{99} = ?}$

A) $\frac{100}{99}$ B) $-\frac{99}{100}$ C) $-\frac{100}{99}$ D) $\frac{98}{99}$ E) $\frac{99}{100}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	B	E	D	B	B	E	E
9	10	11	12	13	14	15	16
B	E	E	B	C	B	A	E

1. $(a_n)=\left(\frac{2n+4}{3n-1}\right),\ (b_n)=\left(\frac{3n+3}{n+2}\right) \Rightarrow a_5-b_1=?$

A) –3 B) –2 C) –1 D) 0 E) 1

2. $a_{n+1}=\frac{3}{2}\cdot an,\ a_2=\frac{3}{2} \Rightarrow a_9=?$

A) $\frac{3}{2}$ B) $\left(\frac{3}{2}\right)^3$ C) $\left(\frac{3}{2}\right)^6$ D) $\left(\frac{3}{2}\right)^8$ E) $\left(\frac{3}{2}\right)^{10}$

3. $(a_n)=\left(\frac{2n+1}{3n+4}\right),\ a_k=\frac{1}{2} \Rightarrow k=?$

A) 1 B) 2 C) 3 D) 4 E) 5

4. $(a_n)=\left(\frac{5n+3}{n+5}\right),\ a_x=3 \Rightarrow x=?$

A) 4 B) 5 C) 6 D) 7 E) 8

5. $(a_n)=\left(\frac{3^n}{(n+2)!}\right),\ \frac{a_n}{a_{n+1}}=4 \Rightarrow n=?$

A) 9 B) 10 C) 12 D) 14 E) 15

6. $(a_n)=n+1,$

$f(x)=3x-2$

$\Rightarrow \sum_{n=1}^{2} a_n\cdot f(a_n)=?$

A) 4 B) 10 C) 20 D) 26 E) 29

7. $(a_n)=\left(\frac{8-2n}{n+3}\right),\ (a_n)>0 \Rightarrow \sum n=?$

A) 18 B) 12 C) 6 D) 4 E) 3

8. $(a_n)\le 0,$

$(a_n)=\left(\frac{n-12}{2n-5}\right) \Rightarrow \sum n=?$

A) 66 B) 69 C) 72 D) 75 E) 78

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9. $0 < (a_n)$,

$(a_n) = \left(\dfrac{-n^2+2n+15}{n^2-2n}\right) \Rightarrow \sum n = ?$

A) 7 B) 9 C) 12 D) 15 E) 17

10. $(a_n) = \left(\dfrac{n^2-9n+14}{n^2+5n+16}\right) < 0 \Rightarrow \sum n = ?$

A) 6 B) 9 C) 12 D) 15 E) 18

11. (a_n) bir aritmetik dizidir.

(a_n) is an arithmetic sequence.

$a_1 = 5,\ a_2 = 12,\ a_3 = 19,\ a_4 = 26 \Rightarrow a_{35} = ?$

A) 231 B) 238 C) 243 D) 250 E) 257

12. (a_n) bir aritmetik dizidir.

(a_n) is an arithmetic sequence.

$a_1 = x-2,\ a_2 = x+1,\ a_3 = 3x-4$

$\Rightarrow a_1 + a_2 + ... + a_{20} = ?$

A) 600 B) 610 C) 620 D) 630 E) 640

13. (a_n) bir geometrik dizidir.

(a_n) is a geometric sequence.

$a_4 = 1,\ a_7 = \frac{1}{8} \Rightarrow a_{20} = ?$

A) 2^{-15} B) 2^{-16} C) 2^{-17} D) 2^{-19} E) 2^{-20}

14. (a_n) bir geometrik dizidir.

(a_n) is a geometric sequence.

$a_k = x-2,\ a_{k+1} = x+1,\ a_{k+2} = x+5 \Rightarrow x = ?$

A) −11 B) −10 C) 2 D) 10 E) 11

15. $(a_n) = (-2n^2+8n-3) \Rightarrow \max(a_n) = ?$

A) 5 B) 7 C) 8 D) 9 E) 11

16. $4 \cdot 2 + 8 \cdot 3 + 12 \cdot 4 + ... + 40 \cdot 11 = ?$

A) 1760 B) 1987 C) 2287 D) 3287 E) 3306

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	D	B	C	A	E	C	D
9	10	11	12	13	14	15	16
A	E	C	B	B	E	A	A

1. $200 + 100 + 50 + \ldots = ?$

A) 400 B) 420 C) 425 D) 450 E) 500

2. $3 + 3 \cdot \frac{1}{2} + 3 \cdot \left(\frac{1}{2}\right)^2 + \ldots + 3 \cdot \left(\frac{1}{2}\right)^n + \ldots = ?$

A) 4 B) 5 C) 6 D) 8 E) 9

3. $1 \cdot 3 + 3 \cdot 5 + 5 \cdot 7 + 7 \cdot 9 + \ldots = ?$

A) $\sum_{k=1}^{\infty} (2k-1) \cdot (2k+1)$

B) $\sum_{k=1}^{4} (k+1) \cdot (k+3)$

C) $\sum_{k=1}^{3} k \cdot (k+2)$

D) $\sum_{k=2}^{5} (k-1) \cdot (k+2)$

E) $\sum_{k=1}^{\infty} 3 \cdot (4k-3)$

4. $\sum_{n=0}^{\infty} \left(\frac{3}{4}\right)^n = ?$

A) 2 B) $\frac{9}{4}$ C) $\frac{5}{2}$ D) $\frac{11}{4}$ E) 4

5. $\sum_{k=1}^{\infty} \left(-\frac{2}{7}\right)^k = ?$

A) $-\frac{1}{9}$ B) $-\frac{2}{9}$ C) $-\frac{7}{9}$ D) $-\frac{2}{7}$ E) $-\frac{3}{7}$

6. $\sum_{k=0}^{\infty} \frac{1}{3^{2k}} = ?$

A) $\frac{9}{8}$ B) $\frac{3}{5}$ C) $\frac{3}{8}$ D) $\frac{3}{4}$ E) $\frac{4}{3}$

7. $\sum_{n=3}^{\infty} \frac{1}{2^n} = ?$

A) $\frac{1}{32}$ B) $\frac{1}{8}$ C) $\frac{1}{16}$ D) $\frac{1}{4}$ E) $\frac{1}{2}$

8. $\sum_{k=1}^{\infty} \frac{2^k}{3^{k+1}} = ?$

A) $\frac{2}{3}$ B) $\frac{3}{2}$ C) $\frac{4}{3}$ D) $\frac{5}{2}$ E) 3

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9. $\sum_{n=1}^{\infty} \frac{2^{2n+3}+3^{n+1}}{6^n} = ?$

A) 15 B) 16 C) 17 D) 18 E) 19

10. $\sum_{n=x}^{\infty} \left(\frac{2}{3}\right)^n = \frac{8}{9} \Rightarrow x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

11. $\sum_{k=1}^{\infty} \frac{3+2^k}{4^k} = ?$

A) 1 B) 2 C) 3 D) 4 E) 6

12. $\sum_{k=4}^{\infty} 3^{-k+2} = ?$

A) $\frac{1}{6}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) 2

13. $\sum_{k=1}^{\infty} \frac{x+2^k}{3^k} = 10 \Rightarrow x = ?$

A) 8 B) 9 C) 10 D) 14 E) 16

14. $\sum_{n=0}^{\infty} \frac{3^{n+1}}{4^{n-1}} = ?$

A) 32 B) 36 C) 48 D) 52 E) 64

15. $\sum_{k=0}^{\infty} \frac{1+2^k+3^k}{4^k} = ?$

A) $\frac{19}{3}$ B) $\frac{20}{3}$ C) 7 D) $\frac{22}{3}$ E) $\frac{23}{3}$

16. $\prod_{k=1}^{\infty} 9^{3^{-k}} = ?$

A) 1 B) 3 C) 9 D) 27 E) 81

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	C	A	E	B	A	D	A
9	10	11	12	13	14	15	16
E	C	B	A	E	C	D	B

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1. $a_n = \begin{cases} n^2, & n \equiv 0(\text{mod}3) \\ \frac{n-10}{2n+1}, & n \equiv 1(\text{mod}3) \\ n+1, & n \equiv 2(\text{mod}3) \end{cases} \Rightarrow \frac{a_5 - a_{10}}{a_6} = ?$

A) $\frac{1}{36}$ B) $\frac{1}{27}$ C) $\frac{1}{18}$ D) $\frac{1}{9}$ E) $\frac{1}{6}$

2. $(a_n) = \left(\frac{3n+3}{n-2}\right) \Rightarrow a_3 + a_5 = ?$

A) 24 B) 18 C) 16 D) 10 E) 2

3. $(a_n) = \left(\frac{3n-4}{n+2}\right)$, $(b_n) = \left(\frac{10}{n+2}\right) \Rightarrow a_{1987} + b_{1987} = ?$

A) 10 B) 7 C) 4 D) 3 E) 1

4. $a_n = \frac{a_{n+1}+1}{n+4}$, $a_3 = 3 \Rightarrow a_4 = ?$

A) 40 B) 20 C) 10 D) 5 E) 0

5. $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \ldots = ?$

A) $\frac{1}{3}$ B) $\frac{1}{9}$ C) $\frac{4}{9}$ D) $\frac{9}{4}$ E) $\frac{1}{2}$

6. $\sum_{n=1}^{\infty} \left(\frac{1}{e}\right)^n = ?$

A) e B) e − 1 C) e + 1 D) $\frac{1}{e+1}$ E) $\frac{1}{e-1}$

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7. $0 < r < 1,\ \sum_{n=1}^{\infty} r^{n+1} = \frac{1}{2} \Rightarrow r = ?$

A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{1}{8}$ D) $\frac{1}{16}$ E) $\frac{1}{32}$

8. $\sum_{n=1}^{\infty} \frac{2^n - 1}{3^{n+1}} = ?$

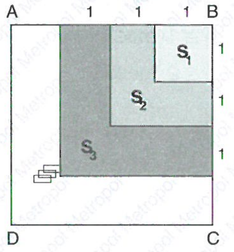
A) $\frac{2}{3}$ B) $\frac{3}{2}$ C) $\frac{1}{2}$ D) 2 E) 4

9. $0 < x < \frac{\pi}{2}$,

$\sum_{n=1}^{\infty} \cos^n x = ?$

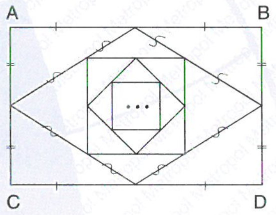
A) $\frac{1}{1-\cos x}$ B) $\frac{1}{1+\cos x}$ C) $\frac{-\sin x}{1-\cos x}$ D) $\frac{-\cos x}{1-\cos x}$ E) $\frac{\cos x}{1-\cos x}$

10. $S_{10} = ?$ br² (u²)



A) 9 B) 14 C) 17 D) 19 E) 26

11.



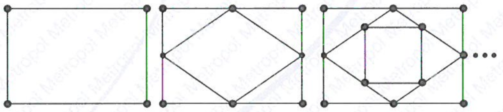
ABCD bir dikdörtgendir. ABCD is a rectangle.

|AB| = 8 cm, |AC| = 4 cm.

⇒ **Toplam alan / The total area = ? br² (u²)**

A) 256 B) 128 C) 64 D) 32 E) 16

12.



1. terim =4
1st term = 4

2. terim = 8
2nd term = 8

3. terim = 12
3rd term = 12

48. terimde kaç tane nokta bulunur?

How many points does the 48th term have?

A) 192 B) 96 C) 48 D) 24 E) 15

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
E	B	D	B	E	E	A	C	E	D	C	A

METROPOL YAYINLARI • METROPOL PUBLICATIONS

1. $n \in Z^+$,

$n! + \sum_{k=0}^{8} (n+k)! \cdot (n+k) = ?$

A) $(n+7)!$ B) $(n+8)!$ C) $(n+9)!$ D) $(2n+8)!$ E) $(2n+10)!$

2. $\sum_{n=0}^{100} 3^n \equiv x(\text{mod}5) \Rightarrow x = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

3. $n \in Z^+$,

$\sum_{k=1}^{n} (-1)^{k+1} \cdot k = 10 \Rightarrow n = ?$

A) 17 B) 18 C) 19 D) 20 E) 21

4. $\sum_{k=2}^{4} \cos(2 \cdot k \cdot x) = T$

$\Rightarrow \sum_{k=2}^{4} \cos^2(k \cdot x) = ?$

A) $T+2$ B) $T+4$ C) $\frac{T+1}{2}$ D) $\frac{T+2}{2}$ E) $\frac{T+3}{2}$

5. $\prod_{n=1}^{7} (3n+2) \equiv 0(\text{mod}10^m)$

$\Rightarrow m \in Z, \max(m) = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

6. A, $n \in Z^+$,

$\prod_{k=1}^{20} k = A \cdot 10^n \Rightarrow \sum n = ?$

A) 10 B) 9 C) 8 D) 7 E) 6

METROPOL YAYINLARI • METROPOL PUBLICATIONS

7. $a_{n+2} = a_{n+1} + a_n \quad (n = 1, 2, \dots)$

$a_8 = 6 \Rightarrow \mathbf{a_6 + a_9 = ?}$

A) 9 B) 10 C) 12 D) 15 E) 16

8. $(a_n) = \left(\frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \dots + \frac{1}{2^n}\right)$

$\Rightarrow \mathbf{a_1 + a_2 + a_3 = ?}$

A) $\frac{7}{8}$ B) $\frac{11}{8}$ C) $\frac{13}{8}$ D) $\frac{15}{8}$ E) $\frac{17}{8}$

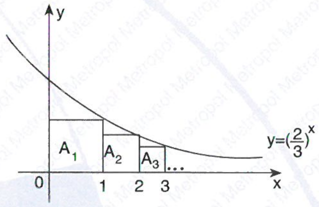
9. $(a_n) = (2^{2n-1}) \Rightarrow \mathbf{a_1 + a_2 + a_3 + \dots + a_n = ?}$

A) $\frac{2}{3} \cdot (4^n - 1)$ B) $\frac{2}{3} \cdot (4^n + 1)$ C) $\frac{2}{3} \cdot (2^n - 1)$ D) $\frac{2}{3} \cdot (2^n + 1)$ E) $\frac{1}{3} \cdot (2^n - 1)$

10. $\sum_{k=1}^{\infty} (-1)^{k+1} \cdot 2^k \cdot 3^{2-k} = ?$

A) $\frac{3}{5}$ B) $\frac{9}{5}$ C) $\frac{18}{5}$ D) $\frac{1}{3}$ E) $\frac{27}{5}$

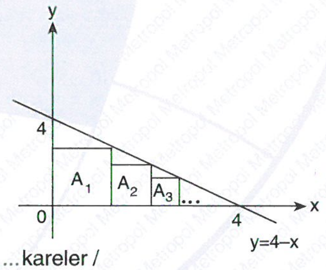
11.



$\Rightarrow \mathbf{A\left(\sum_{n=1}^{\infty} An\right) = Area\left(\sum_{n=1}^{\infty} An\right) = ?}$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) $\frac{4}{3}$ E) 2

12.



$A_1, A_2, A_3, \dots$ kareler /

$A_1, A_2, A_3, \dots$ are squares

$\Rightarrow \mathbf{A\left(\sum_{n=1}^{\infty} An\right) = Area\left(\sum_{n=1}^{\infty} An\right) = ?}$

A) $\frac{9}{2}$ B) $\frac{11}{2}$ C) $\frac{14}{3}$ D) $\frac{16}{3}$ E) $\frac{20}{3}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
C	B	C	E	A	A	C	E	A	B	E	D

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1. $\sum_{n=-4}^{13} \prod_{k=1}^{n} \left(1+\frac{1}{k}\right) = ?$

A) 99 B) 98 C) 97 D) 96 E) 95

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

2. $\sum_{n=0}^{\infty} \frac{3^{n-1}}{5^n} = ?$

A) $\frac{5}{2}$ B) $\frac{5}{3}$ C) $\frac{5}{4}$ D) $\frac{5}{6}$ E) $\frac{5}{8}$

[BALIKESİR ÜNİVERSİTESİ – YÖS 2018]

3. **Bir aritmetik dizinin ilk üç terimi sırasıyla a – 1, 2a + 5, 5a + 1 olduğuna göre, bu dizinin beşinci terimi kaçtır?**

According to the fact that an first three terms of arithmetic sequence are a – 1, 2a + 5, and 5a + 1, respectively. What is the fifth term of this sequence?

A) 39 B) 42 C) 46 D) 48 E) 52

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

4. **Bir geometrik dizinin ilk üç terimi sırasıyla (x – 3), (2x – 3) ve (4x + 3) olduğuna göre, bu dizinin sekizinci terimi kaçtır?**

According to the fact that first three terms of a geometrical sequence are (x – 3), (2x – 3) and (4x + 3), respectively. What is the eighth term of this sequence?

A) 3^4 B) 3^5 C) 3^6 D) 3^7 E) 3^8

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

5. $\prod_{n=1}^{x} a_n = 9^{x!} \Rightarrow a_4 = ?$

A) 9^{36} B) 9^{24} C) 3^{50} D) 3^{36} E) 3^{24}

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

6. $\prod_{k=-3}^{2n-3} \left(\frac{k+4}{k+5}\right) = \frac{1}{20} \Rightarrow n = ?$

A) 9 B) 10 C) 11 D) 12 E) 13

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

7. $\sum_{k=0}^{10} k \cdot n^4 \cdot \prod_{m=1}^{3} \frac{2m}{n} = ?$

A) $2640 \cdot n$ B) $1056 \cdot n$ C) $2640 + n$ D) $\frac{2640}{n}$ E) $10560 \cdot n$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

8. **p bir pozitif tamsayı olmak üzere,**

If p is a positive integer,

$\sum_{n=0}^{17} (3n + p) = ?$

A) $459 + 18p$ B) $462 + 17p$ C) $54 + p$ D) $459 + 17p$ E) $462 + 18p$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $\sum_{k=1}^{120}(-1)^k\cdot(k+1)=?$

A) 10 B) 30 C) 60 D) 120 E) 160

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

10. $n\in N,\ n\geq 1$

$a_0=1,\ a_n=\frac{1}{n+1}\cdot a_{n-1}\ \Rightarrow\ a_5=?$

A) 5! B) 6! C) $\frac{1}{5!}$ D) $\frac{1}{6!}$ E) $\frac{5!}{6!}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

11. $\prod_{k=1}^{31}\left(\frac{2}{3}\right)^{(-1)^k}=?$

A) −1 B) 1 C) $\frac{2}{3}$ D) $\frac{3}{2}$ E) $\frac{4}{9}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2014]

12. $a_1=1$

$(a_n)=\frac{n}{n+2}\cdot(a_{n-1})\ \Rightarrow\ a_6=?$

A) $\frac{3}{28}$ B) $\frac{3}{56}$ C) $\frac{3}{14}$ D) $\frac{5}{32}$ E) $\frac{5}{24}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2014]

13. $\sum_{k=0}^{10}\frac{n}{n+1}=?$

A) 10 B) 11 C) $\frac{10n}{n+1}$ D) $\frac{11n}{n+1}$ E) 0

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2014]

14. $|x|<1\ \Rightarrow\ \sum_{n=1}^{\infty}x^n=?$

A) $\frac{1}{1-x}$ B) $\frac{1}{1+x}$ C) $\frac{x}{1-x}$ D) 1 E) 10

[İSTANBUL ÜNİVERSİTESİ – YÖS 2013]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

YANITLAR / ANSWERS

1	2	3	4	5	6	7
A	D	D	E	D	A	A
8	9	10	11	12	13	14
A	C	D	D	A	D	C

BÖLÜM CHAPTER 10

TARİHSEL NOT / HISTORICAL NOTE

BÎRÛNÎ [973 - 1051]

Matematik, gökbilim, doğa bilimleri, coğrafya ve tarih alanındaki çalışmalarıyla tanınır. Bîrûnî'nin matematikçi yönü en çok bilinen yönüdür. Yaşadığı yüzyılın en büyük matematikçisi olan Bîrûnî, trigonometrik fonksiyonlarda yarıçapın bir birim olarak kabul edilmesini öneren ilk kişi olup sinüs ve kosinüs gibi fonksiyonlara sekant, kosekant ve kotanjant fonksiyonlarını ilave etmiştir. Bîrûnî'nin bu yönü Batı Dünyası tarafından ancak iki asır sonra keşfedilip kullanılabilmiştir.

He is known for his work in mathematics, astronomy, natural sciences, geography and history. The mathematician aspect of Bîrûnî is the most known aspect. Bîrûnî, the greatest mathematician of the century in which he lived, was the first to propose that the radius be accepted as a unit in trigonometric functions and he added secant, cosecant and cotangent functions to functions such as sine and cosine. This work of Bîrûnî was not discovered and used by the Western World until after two centuries.

ÖZEL TANIMLI FONKSİYONLAR
THE SPECIAL DOMAIN FUNCTIONS

Bu bölüm 16 alıştırma sorusu, 40 test sorusu, 6 YÖS sorusu içermektedir.

This chapter includes 16 exercise questions, 40 test questions, and 6 YÖS questions.

BÖLÜM / CHAPTER 10

ÖZEL TANIMLI FONKSİYONLAR / THE SPECIAL DOMAIN FUNCTIONS

- Özel Tanımlı Fonksiyonlar / The Special Domain Functions . . . . 287 – 296

BÖLÜM 10 CHAPTER

ÖZEL TANIMLI FONKSİYONLAR
THE SPECIAL DOMAIN FUNCTIONS

1. $f:(-1,2] \to A,$
$f(x)=4x-2 \Rightarrow \mathbf{A=?}$

Yanıt / The Answer is $(-6,6]$

2. $f:(0,7] \to A,$
$f(x)=x^2-6x+5 \Rightarrow \mathbf{A=?}$

Yanıt / The Answer is $[-4,12]$

3. $f:\left[\frac{1}{6},\infty\right) \to (0,\infty)$
$f(x)=\sqrt{6x-1} \Rightarrow \mathbf{f^{-1}(x)=?}$

Yanıt / The Answer is $\dfrac{x^2+1}{6}$

4. $f:[3,\infty) \to [-1,\infty),$
$f(x)=x^2-4x+3 \Rightarrow \mathbf{f^{-1}(x)=?}$

Yanıt / The Answer is $\sqrt{x+1}+2$

5. $f:(5,\infty) \to R$
$f(x)=\log_2(x-5) \Rightarrow \mathbf{f^{-1}(x)=?}$

Yanıt / The Answer is 2^x+5

6. $f:A \to B,\ A,B \subseteq R$
$f(x)=\sqrt{1-x^2} \Rightarrow \mathbf{A=?}$

Yanıt / The Answer is $[-1,1]$

7. $f:A \to B,\ A,B \subseteq R$
$f(x)=\sqrt[3]{\dfrac{x+2}{x-1}} \Rightarrow \mathbf{A=?}$

Yanıt / The Answer is $R-\{1\}$

8. $f:A \to B,\ A,B \subseteq R$
$f(x)=\dfrac{x-5}{|x-2|-1} \Rightarrow \mathbf{A=?}$

Yanıt / The Answer is $R-\{1,3\}$

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9. $f(x)=\begin{cases}2x-5, & x<2\\ 3x+1, & x\geqslant 2\end{cases} \Rightarrow \mathbf{f(0)+f(2)=?}$

Yanıt / The Answer is 2

10. $|x+2|-4x=6 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\left\{-\frac{4}{3}\right\}$

11. $||x-1|-2|=4 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{-5,7\}$

12. $\operatorname{sgn}(x^2-x-6)=1 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $R-[-2,3]$

13. $\operatorname{sgn}(x^2+x+1)=-1 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is Ø

14. $\left[\left|-5,89\right|\right]+\left[\left|\frac{1}{e}\right|\right]+\left[\left|-\pi\right|\right]+\left[\left|3,1\right|\right]=?$

Yanıt / The Answer is -7

15. $f(2^x)=\left[\left|x\cdot e\right|\right] \Rightarrow f\left(\frac{1}{4}\right)=?$

Yanıt / The Answer is -6

16. $f: A \to B,\ A,B \subseteq R$

$f(x)=\dfrac{\sqrt{15-x}}{x^2-6x+8} \Rightarrow$ **A = ?**

Yanıt / The Answer is $(-\infty,15]-\{2,4\}$

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1. $f: R \to R,\ g: R \to R$

$$f(x) = \begin{cases} 3x + 2, & x \le 4 \\ x - 3, & 4 < x \end{cases} \quad , \quad g(x) = \begin{cases} x^2 + 1, & x < 2 \\ 2x - 4, & 2 \le x \end{cases}$$

$\Rightarrow$ **(fog)(3) = ?**

A) 8 B) 9 C) 10 D) 12 E) 14

2. $$f(x) = \begin{cases} 3 - x^2, & x \ge 3 \\ x^2 - 1, & x < 3 \end{cases} \quad , \quad g(x) = \begin{cases} x - 2, & x > 0 \\ x - 3, & x \le 0 \end{cases}$$

$\Rightarrow$ **(fog)(4) + (gof)(4) = ?**

A) –19 B) –16 C) –13 D) –10 E) –8

3. $x < 1$,

$f(x) = |x - 1| + |x + |x - 1||$ $\Rightarrow$ **f(x) = ?**

A) x B) 2 – x C) x+2 D) 3 – x E) 1

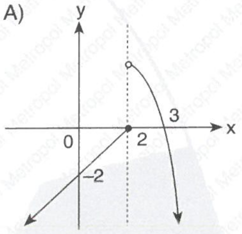
4. $f: A \to R$,

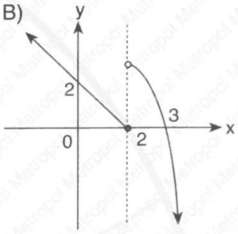
$f(x) = |x + 1| + 4$ $\Rightarrow$ **f(A) = ?**

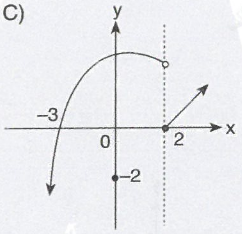
A) $[-1, \infty)$ B) $[0, \infty)$ C) $[2, \infty)$ D) $[3, \infty)$ E) $[4, \infty)$

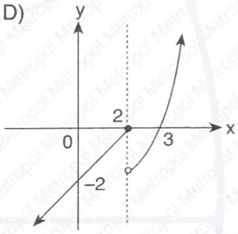
5. $$f(x) = \begin{cases} x - 2, & x \le 2 \\ 9 - x^2, & 2 < x \end{cases}$$

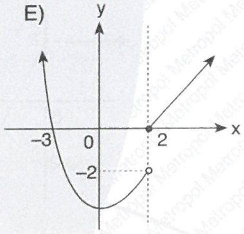
$\Rightarrow$ **Grafik (Graph) = ?**

A)


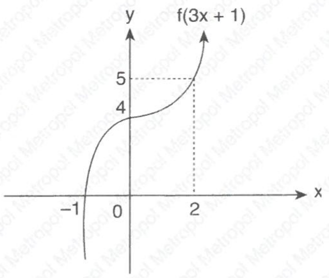
B)


C)


D)


E)


6. $$\frac{f(7) + f^{-1}(0)}{f^{-1}(4)} = ?$$



A) –3 B) –2 C) 0 D) 2 E) 3

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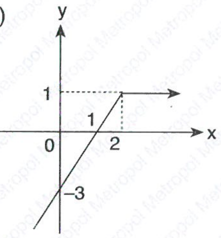
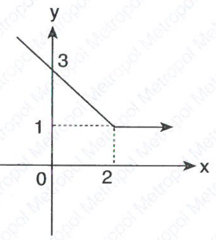
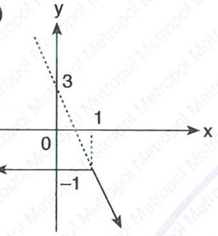
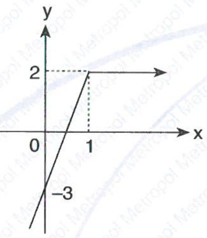
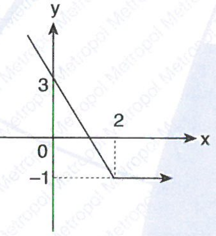
7. $f(x) = -x + 1 + |x - 2| \Rightarrow$ **Grafik (Graph) = ?**

A)


B)


C)


D)


E)


8. **f(x) = y = ?**

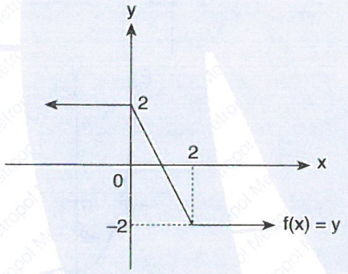
A) $y = |x - 2| - |x|$

B) $y = |x + 2| - |x|$

C) $y = |x - 2| + |x|$

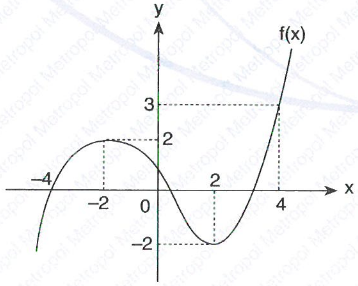
D) $y = |x + 2| + |x|$

E) $y = |x - 2|$



9. $g(x) = 2 - f(x - 1)$

$\Rightarrow$ **g(–1) + g(5) = ?**



A) –2 B) –1 C) 0 D) 1 E) 2

10. $f(x) = |x| + |x - 1| = ?$

A) $f(x) = \begin{cases} 2x-1, & x \geq 1 \\ 2x+1, & x < 1 \end{cases}$

B) $f(x) = \begin{cases} 2x-1, & x \geq 1 \\ 1, & 0 \leq x < 1 \\ -2x+1, & x < 0 \end{cases}$

C) $f(x) = \begin{cases} 1, x \geq 1 \\ 2x-1, 0 \leq x < 1 \\ -1, x < 0 \end{cases}$

D) $f(x) = \begin{cases} x-1, & x > 1 \\ 2x-1, 0 \leq x \leq 1 \\ 1, & x > 0 \end{cases}$

E) $f(x) = \begin{cases} 3x-1, & x \geq 1 \\ 2x-1, 0 \leq x < 1 \\ x-1, & x < 0 \end{cases}$

11. $x \in Z,\ f(x) \in R,$

$f(x) = \sqrt{5 - |2x - 3|} \Rightarrow \sum x = ?$

A) 8 B) 9 C) 10 D) 12 E) 15

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11
A	C	B	E	A	E	E	A	B	B	B

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1. $f(x) = \begin{cases} x^2 - 2, & 2 \le x \\ x + 2, & x < 2 \end{cases}$

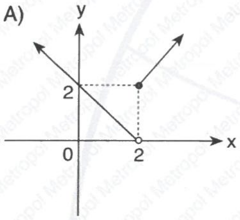
$\Rightarrow$ **(fofof)(1) = ?**

A) 45 B) 46 C) 47 D) 48 E) 49

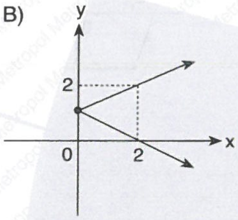
2. $f(x) = \begin{cases} x+2, & 2 < x \\ 2, & x = 2 \\ -x+2, & x < 2 \end{cases}$

$\Rightarrow$ **Grafik (Graph) = ?**

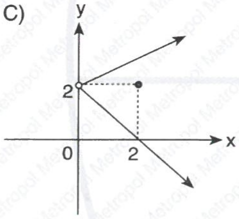
A)



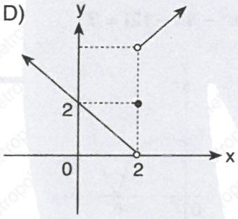
B)



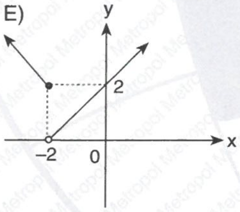
C)



D)



E)



3. $f(x) = |2x-\pi| - |x-e|$

$\Rightarrow$ **$f(\pi + 1) = ?$**

A) e^2 B) e C) 2e D) e+1 E) e − 1

4. $x \in N$,

$|x^2 - 9| = 9 - x^2 \Rightarrow \sum x = ?$

A) 0 B) 1 C) 2 D) 3 E) 6

5. $|x - 4| + x \le 3 \Rightarrow$ **ÇK(SS) = ?**

A) $\left(-\infty, \frac{7}{2}\right]$ B) $\left[\frac{7}{2}, \infty\right)$ C) $\left[\frac{7}{2}, 4\right]$ D) $\varnothing$ E) R

6. $f(x) \in R$, $x \in Z$,

$f(x) = \dfrac{\sqrt{7-|2x-1|}}{x-2} \Rightarrow \sum x = ?$

A) 2 B) 3 C) 4 D) 6 E) 8

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7. $f(x) \in R$,

$f(x)=\sqrt{\dfrac{x-1}{|x|-2}} \Rightarrow$ **ÇK(SS) = ?**

A) [1, 2) B) (–2, 1] ∪ (2, ∞) C) (–2, ∞) D) (–2, 1] E) [1, ∞)

8. $f: R \to R - \left\{\dfrac{\pi}{4}, \dfrac{3\pi}{4}\right\}$

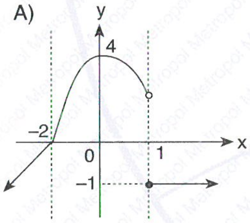
$$f(x)=\begin{cases} \cos 2x, & x \le \dfrac{3\pi}{2} \\ \dfrac{1-\sin^2 x}{2}, & x > \dfrac{3\pi}{2} \end{cases}$$

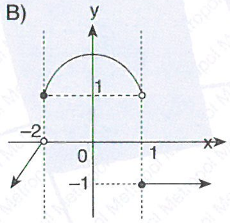
$\Rightarrow$ **$f\left(\dfrac{\pi}{2}\right)+f(2\pi)=?$**

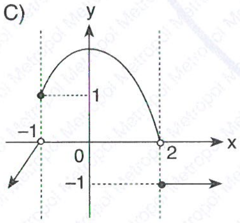
A) $-\dfrac{1}{2}$ B) $-\dfrac{1}{4}$ C) $-\dfrac{1}{8}$ D) $-\dfrac{1}{16}$ E) $-\dfrac{1}{32}$

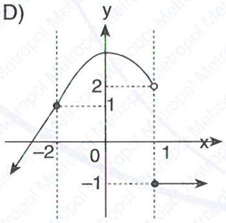
9. $f(x)=\begin{cases} x+2, & x<-2 \\ 4-x^2, & -2 \le x < 1 \\ -1, & 1 \le x \end{cases}$

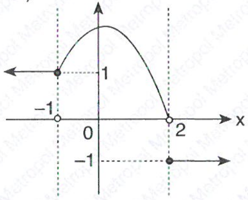
$\Rightarrow$ **Grafik (Graph) = ?**

A)


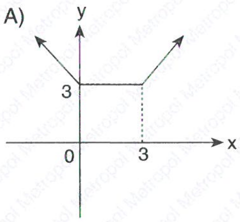
B)


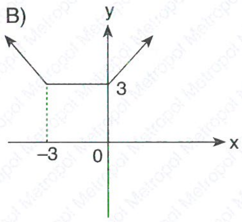
C)


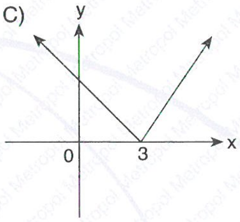
D)


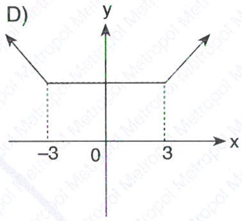
E)


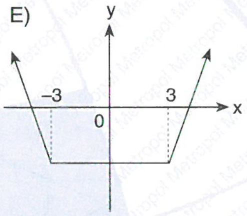
10. $f(x) = |x-3| + |x| \Rightarrow$ **Grafik (Graph) = ?**

A)


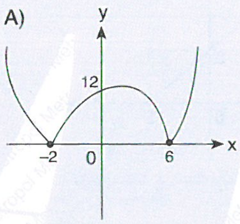
B)


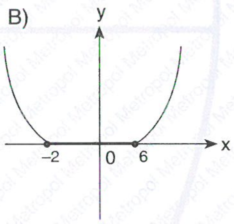
C)


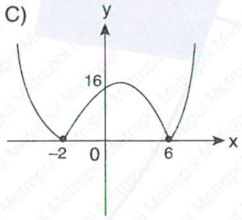
D)


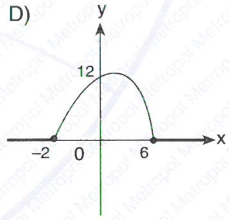
E)


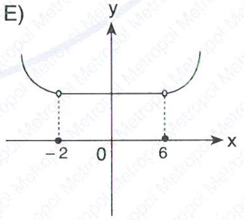
11. **$y = |x^2 - 4x - 12| = ?$**

A)


B)


C)


D)


E)


YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11
C	D	D	E	A	A	B	A	A	A	A

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1. $A = |x-4| + |7-x| \Rightarrow \min(A) = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

2. $-2 \le |2x-8| \le 8 \Rightarrow$ ÇK(SS) = ?

A) $[0,1]$ B) $[0,4]$ C) $[0,8]$ D) $[0,16]$ E) $[0,32]$

3. $f(x) = \dfrac{\sqrt{9-x^2}}{1-[|x|]} \Rightarrow$ ÇK(SS) = ?

A) $[-3,3]$ B) $[1,2)$ C) $[-3,1)$ D) $(2,3]$ E) $[-3,3]-[1,2)$

4. $[|\,x + [|\,x + [|x|]\,|]\,|] = 9 \Rightarrow$ ÇK(SS) = ?

A) [1, 2) B) [2, 3) C) [3, 4) D) [4, 5) E) [5, 6)

5. $[|x|]^2 - 5\cdot[|x|] + 6 = 0 \Rightarrow x \in Z, \sum x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

6. $x^2 - 2 = x\cdot \text{sgn}(x) \Rightarrow$ ÇK(SS) = ?

A) {0} B) {–2, 0, 2} C) {–2} D) {2} E) {–2, 2}

7. $\text{sgn}(x^2+3) = \left[\left|\dfrac{x}{3} - 1\right|\right]$

$x \in Z$ için(for) $\Rightarrow \sum x = ?$

A) 13 B) 14 C) 15 D) 21 E) 24

8. $f(x) = |x-1| - \text{sgn}(1-x)$,

$0 < x < 1 \Rightarrow f(x) = ?$

A) –x – 1 B) –x + 1 C) –x D) x – 1 E) x

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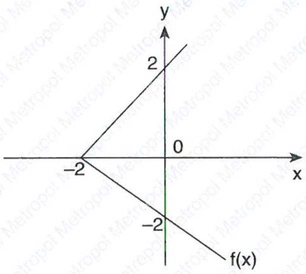
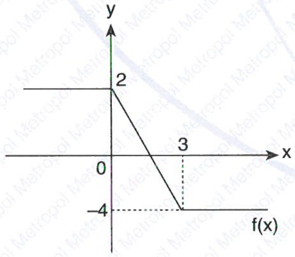
9.



$\Rightarrow f(x) = ?$

A) y = |x + 2|
B) |y| = x + 2
C) |y| = |x + 2|
D) |y| − |x| = 2
E) |y−x| = 2

10.



$\Rightarrow f(x) = ?$

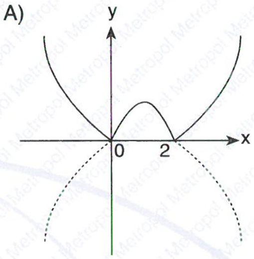
A) y = |x + 3| − |x| − 1
B) y = |x − 2| + |x| − 2
C) y = |x − 3| − |x| − 1
D) y = |x + 4| − |x| − 2
E) y = |x − 2| − |x|

11. **$f : R^+ \rightarrow R$,**

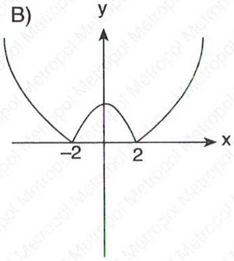
f(x) = x | x − 2 | fonksiyonunun grafiği aşağıdakilerden hangisidir?

Which of the followings is the graph of the function f(x) =x| x − 2 |?

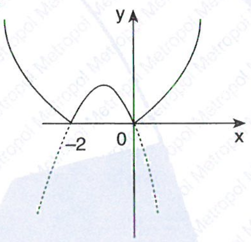
A)



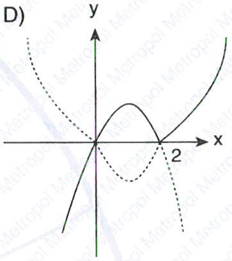
B)



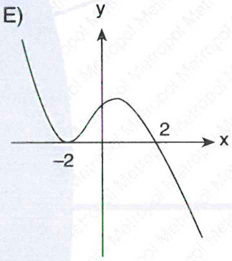
C)



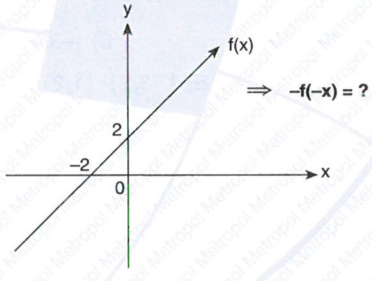
D)



E)



12.



$\Rightarrow -f(-x) = ?$

A) x + 2
B) x + 1
C) −x + 2
D) x − 2
E) x − 1

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
A	C	E	C	D	E	D	C	B	C	D	D

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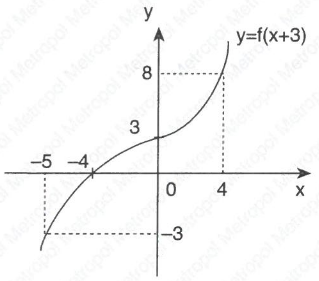
1.



$$\Rightarrow \frac{f^{-1}(8)+f(3)}{f(-1)+f^{-1}(-3)}=?$$

A) –8 B) –6 C) –5 D) 0 E) 7

2. $f(x)=|x+1|,$

$x\cdot f(x-2)\le 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, 2]$ B) $\left(-\infty,\frac{2}{3}\right)$ C) $(-\infty,0]\cup\{1\}$

D) $[-1, 1]$ E) $[0, \infty)$

3.
$$f(x)=\begin{cases}\frac{x-3}{4}, & x\le 4\\ x^2+4, & x>4\end{cases}$$

$$g(x)=\begin{cases}x^2-3, & x<5\\ 2, & 5<x\le 7\\ 2x-3, & 7<x\end{cases}$$

$\Rightarrow$ **$(fog)(6)+(f+g)(3)=?$**

A) $\frac{21}{4}$ B) $\frac{4}{21}$ C) 4 D) $\frac{23}{4}$ E) $\frac{4}{23}$

4. $f:[0,3]\to R$

$f(x)=x^2-|6x-x^2|$

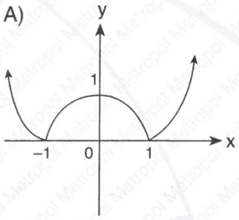
$\Rightarrow$ **$\min(f(x))=?$**

A) $-\frac{1}{2}$ B) $-\frac{3}{2}$ C) $-\frac{5}{2}$ D) $-\frac{7}{2}$ E) $-\frac{9}{2}$

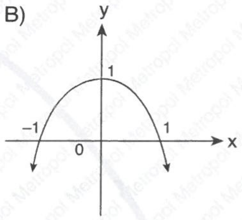
5. $|y|=x^2-1$ fonksiyonunun grafiği aşağıdakilerden hangisidir?

Which of the followings is the graph of the function $|y|=x^2-1$?

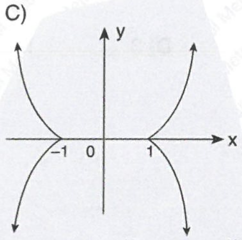
A)



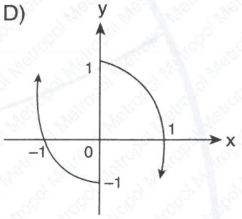
B)



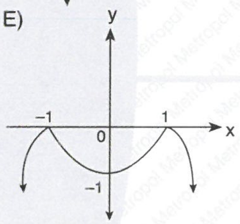
C)



D)



E)



6. $f:R\to R,\ g:R\to R$

$$f(x)=\begin{cases}2x-1, & x\le 6\\ x+3, & 6<x\end{cases}$$

$$g(x)=\begin{cases}-4x, & x<0\\ x^2, & 0\le x\end{cases}\Rightarrow (f+g)(5)=?$$

A) 31 B) 32 C) 33 D) 34 E) 35

YANITLAR / ANSWERS

1	2	3	4	5	6
C	C	D	E	C	D

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1. $|x| = -x,\ y^2 < y$

$\Rightarrow |x - y| - \sqrt{x^2} - \sqrt{y^2} + 3 \cdot |x| = ?$

A) 3x B) 0 C) –3x D) 2x E) –2x

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

2. $f(x,y) = x^y - y^x \Rightarrow f(f(3,1),2) = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

[İNÖNÜ ÜNİVERSİTESİ – YÖS 2018]

3. $f(x) = \begin{cases} x+1, & x < 0 \\ x-2, & x \geq 0 \end{cases}$ ve (and) $g(x,y) = \dfrac{3y-2}{xy+1}$

$\Rightarrow (fog)(0,1) = ?$

A) 3 B) 2 C) 10 D) 7 E) –1

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

4. $x < \dfrac{5}{3}$

$\Rightarrow |5 - 3x| - \sqrt{9x^2 - 30x + 25} + 3x - 1 = ?$

A) 4 B) $3x-1$ C) $9-3x$

D) $3x-9$ E) $1-3x$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2013]

5. $f(n+1) = \begin{cases} \dfrac{1}{n-1}, & n \equiv 0 \pmod 2 \\ \dfrac{1}{n+1}, & n \equiv 1 \pmod 2 \end{cases}$

$\Rightarrow f(3) + f(4) = ?$

A) $\frac{7}{4}$ B) $\frac{5}{2}$ C) $\frac{5}{4}$ D) $\frac{4}{5}$ E) $\frac{2}{5}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

6. $\left.\begin{array}{l} f(x) = 5x - 7 \\ g(x) = \begin{cases} x^3 + 1; & x \geq 0 \\ 3x + 5; & x < 0 \end{cases} \end{array}\right\} \Rightarrow (gofog)(-1) = ?$

A) 2 B) 9 C) 13 D) 18 E) 28

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

YANITLAR / ANSWERS

1	2	3	4	5	6
C	A	E	B	C	E

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BÖLÜM CHAPTER 11

TARİHSEL NOT / HISTORICAL NOTE

LEONHARD EULER [1707 - 1783]

İsviçreli matematikçi ve fizikçi. 18. yüzyılın en önemli ve tüm zamanların önde gelen matematikçilerinden biri kabul edilmektedir. En üretken matematikçilerden biri olarak çalışmalarının bütünü 70 cildi aşmaktadır. Euler pek çok yeni kavram geliştirmiş, basit aritmetikten sayılar teorisi ve topolojiye kadar farklı alanlarda uzun süre kabul gören birçok teorem ispatlamıştır. Bu çalışmaları esnasında, günümüzde kullanılan modern matematik terminolojisinin yaratıcısı olmuş, fonksiyon kavramı ve onun yazımını tanımlamıştır (yaptığı bu çalışma için verilebilecek örneklerden bazıları trigonometrik fonksiyonlar için yaptığı sin, cos ve tan tanımlamalarıdır).

Swiss mathematician and physicist. It is regarded as one of the most important and all-time leading mathematicians of the 18th century. As one of the most prolific mathematicians, his works exceed 70 volumes. Euler has developed a number of new concepts, and has proved many theorems that have long been accepted in different fields from simple arithmetic to number theory and topology. During these practices, he became the creator of modern mathematics terminology used today and he also defined the concept writing and of function (some of the examples that he made for this study are the definitions of sin, cos and tan for trigonometric functions).

LİMİT
LIMITS

Bu bölüm 64 alıştırma sorusu, 55 test sorusu içermektedir.

This chapter includes 64 exercise questions and 55 test questions.

BÖLÜM / CHAPTER 11

LİMİT / LIMITS

- Limit / Limits .... 299 – 314

LİMİT
LIMITS

1. $\lim\limits_{x \to 2}(x^3 - 5x + 1) = ?$

Yanıt / The Answer is -1

2. $\lim\limits_{x \to -1}(x^4 - 3x^3 + x^2 - 1) = ?$

Yanıt / The Answer is 4

3. $\lim\limits_{x \to 3}(3x^2 - 2m + 1) = 20 \Rightarrow m = ?$

Yanıt / The Answer is 4

4. $\lim\limits_{x \to -3}(x^3 - ax) = 9 \Rightarrow a = ?$

Yanıt / The Answer is 12

5. $\lim\limits_{x \to -1} 4 + \lim\limits_{x \to 2} 6 + \lim\limits_{x \to 0} 1 = ?$

Yanıt / The Answer is 11

6. $\lim\limits_{x \to 3}(\sqrt{x+13} - \sqrt{7-x}) = ?$

Yanıt / The Answer is 2

7. $\lim\limits_{x \to \frac{1}{2}}(\sqrt{22 - |4x - 8|}) = ?$

Yanıt / The Answer is 4

8. $\lim\limits_{x \to 3}\left(3x + \log_2(3x + 7)\right) = ?$

Yanıt / The Answer is 13

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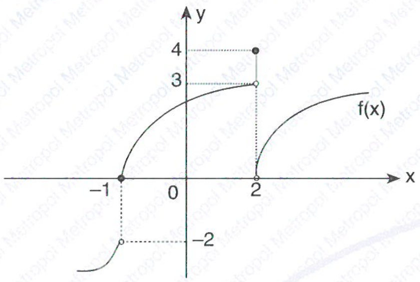
9 – 11. soruları aşağıdaki grafiğe göre yanıtlayınız.
Answer the questions 9 – 11 based on the following graph.



9. $\lim\limits_{x \to 2^+} f(x) = ?$

Yanıt / **The Answer is 0**

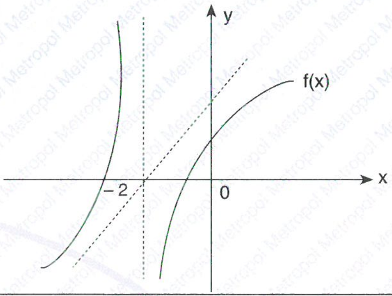
10. $\lim\limits_{x \to -1^-} f(x) = ?$

Yanıt / **The Answer is –2**

11. $\lim\limits_{x \to 2} f(x) = ?$

Yanıt / **The Answer is Limit yoktur./**
Limit does not exist.

12 – 14. soruları aşağıdaki grafiğe göre yanıtlayınız.
Answer the questions 12 – 14 based on the following graph.



12. $\lim\limits_{x \to -2^+} f(x) = ?$

Yanıt / **The Answer is** $-\infty$

13. $\lim\limits_{x \to -\infty} f(x) = ?$

Yanıt / **The Answer is** $-\infty$

14. $\lim\limits_{x \to +\infty} f(x) = ?$

Yanıt / **The Answer is** $+\infty$

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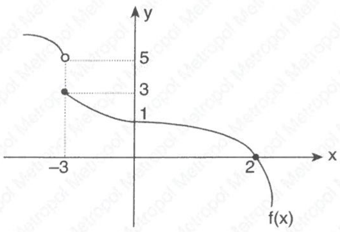
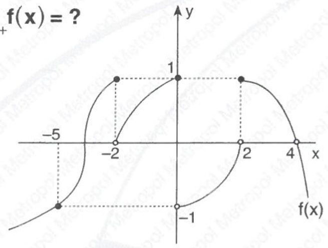
15. $\dfrac{\lim\limits_{x \to -3^+} f(x)}{\lim\limits_{x \to -3^-} f(x)} = ?$



Yanıt / The Answer is $\frac{3}{5}$

16. $\lim\limits_{x \to -5} f(x) + \lim\limits_{x \to -2^+} f(x) - \lim\limits_{x \to 2^+} f(x) = ?$



Yanıt / The Answer is –2

17 – 19 soruları aşağıdaki fonksiyona göre yanıtlayınız.

Answer the questions 17–19 are based on the following function.

$$f(x) = \begin{cases} 3x+1, & x \geqslant 2 \\ x-2, & x < 2 \end{cases}$$

17. $\lim\limits_{x \to -2} f(x) = ?$

Yanıt / The Answer is – 4

18. $\lim\limits_{x \to 2^+} f(x) = ?$

Yanıt / The Answer is 7

19. $\lim\limits_{x \to 2} f(x) = ?$

Yanıt / The Answer is Limit yoktur./ Limit does not exist

20. $f(x) = \begin{cases} kx+3, & x < -1 \\ 3, & x = -1 \\ x+4, & x > -1 \end{cases}$

$\lim\limits_{x \to -1} f(x) = 3 \Rightarrow$ **k = ?**

Yanıt / The Answer is 0

21. $f(x) = \begin{cases} 4-x^2, & x \geqslant 1 \\ x+2, & x < 1 \end{cases}$

$\Rightarrow \lim\limits_{x \to 1} f(x) = ?$

Yanıt / The Answer is 3

22. $f(x) = \begin{cases} x^2-4a, & x \leqslant 2 \\ -5x+b, & x > 2 \end{cases}$

$\lim\limits_{x \to 2} f(x) = -4 \Rightarrow$ **a – b = ?**

Yanıt / The Answer is – 4

23. $\lim\limits_{x \to 4^+} |4-x| = ?$

Yanıt / The Answer is 0

24. $\lim\limits_{x \to 0^-} \dfrac{|x|}{x} = ?$

Yanıt / The Answer is –1

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25. $\lim\limits_{x \to 0^+} \frac{|x|}{x} = ?$

Yanıt / The Answer is 1

26. $\lim\limits_{x \to 2^+} \frac{|2-x|}{x-2} = ?$

Yanıt / The Answer is 1

27. $\lim\limits_{x \to 3^-} \frac{x^2-9}{|x-3|} = ?$

Yanıt / The Answer is –6

28. $\lim\limits_{x \to 2^+} \frac{4}{x-2} = ?$

Yanıt / The Answer is ∞

29. $\lim\limits_{x \to 4^+} \frac{1}{4-x} = ?$

Yanıt / The Answer is $-\infty$

30. $\lim\limits_{x \to 5^+} \frac{5x+1}{x-5} = ?$

Yanıt / The Answer is ∞

31. $\lim\limits_{x \to -1^+} \frac{x+3}{x+1} = ?$

Yanıt / The Answer is ∞

32. $\lim\limits_{x \to \infty} \frac{8}{x-2} = ?$

Yanıt / The Answer is 0

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33. $\lim_{x \to \infty} 2^x = ?$

Yanıt / The Answer is ∞

34. $\lim_{x \to \infty} \left(\frac{1}{2}\right)^x = ?$

Yanıt / The Answer is 0

35. $\lim_{x \to 1^+} \frac{4x+2}{x-1} = ?$

Yanıt / The Answer is ∞

36. $\lim_{x \to 1^-} \frac{4x+2}{(x-1)^2} = ?$

Yanıt / The Answer is ∞

37. $\lim_{x \to 1} \frac{4x+2}{(x-1)^2}$

Yanıt / The Answer is ∞

38. $\lim_{x \to 0^-} (4^{\frac{1}{x}} - 2^x + 4) = ?$

Yanıt / The Answer is 3

39. $\lim_{x \to \infty} \left(\frac{1}{2}\right)^{-x} = ?$

Yanıt / The Answer is ∞

40. $\lim_{x \to -\infty} \left(\frac{5}{2}\right)^x = ?$

Yanıt / The Answer is 0

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41. $\lim\limits_{x \to -\infty} 5^{-x} = ?$

Yanıt / The Answer is ∞

42. $\lim\limits_{x \to 1^-} \dfrac{1}{2^{x-1}} = ?$

Yanıt / The Answer is 1

43. $\lim\limits_{x \to \infty} (x^2 + x + 4) = ?$

Yanıt / The Answer is ∞

44. $\lim\limits_{x \to \infty} (-2x^3 + 2) = ?$

Yanıt / The Answer is $-\infty$

45. $\lim\limits_{x \to -\infty} (4x^7 - x^3 + 1) = ?$

Yanıt / The Answer is $-\infty$

46. $\lim\limits_{x \to \frac{\pi}{2}} \left(\dfrac{\cos x + 1}{2 - \sin x}\right) = ?$

Yanıt / The Answer is 1

47. $\lim\limits_{x \to \frac{\pi}{3}} (\cos x + \sin x) = ?$

Yanıt / The Answer is $\dfrac{\sqrt{3}+1}{2}$

48. $\lim\limits_{x \to 1} (3x \cdot f(x)) = 12$

$\Rightarrow \lim\limits_{x \to 1} f(x) = ?$

Yanıt / The Answer is 4

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49. $\lim\limits_{x \to \frac{3\pi}{4}} \left(\dfrac{-1-\tan x}{6-4\cot x} \right) = ?$

Yanıt / The Answer is 0

50. $\lim\limits_{x \to \frac{2\pi}{3}} \left(\dfrac{\sqrt{3} \cdot \sin x}{\frac{-1}{2} + \cos x} \right) = ?$

Yanıt / The Answer is $-\frac{3}{2}$

51. $\lim\limits_{x \to \frac{\pi}{2}} \left(\dfrac{\sin^2 x - \cos^2 x}{1+\cot^2 x} \right) = ?$

Yanıt / The Answer is 1

52. $\lim\limits_{x \to \frac{\pi}{2}} (\sin x - 1) = ?$

Yanıt / The Answer is 0

53. $\lim\limits_{x \to 2} (x^2 + 2a - 1) = 9 \Rightarrow a = ?$

Yanıt / The Answer is 3

54. $\lim\limits_{x \to 0} \dfrac{x^3+3x-5}{x^2+x+1} = ?$

Yanıt / The Answer is – 5

55. $m \in R^+$,

$\lim\limits_{x \to -1} (x^2 - mx)^2 \cdot (x+2) = 9 \Rightarrow m = ?$

Yanıt / The Answer is 2

56. $\lim\limits_{x \to 3} f(x) = 2, \quad \lim\limits_{x \to 3} g(x) = -2$

$\Rightarrow \lim\limits_{x \to 3} [f(x) + 2g(x)] = ?$

Yanıt / The Answer is – 2

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57. $\lim_{x\to -1} f(x) = -2,\ \lim_{x\to -1} g(x) = 2$

$\Rightarrow \lim_{x\to -1} \sqrt{f^3(x) + 4\cdot g^2(x) + 1} = ?$

Yanıt / The Answer is 3

58. $\lim_{x\to 2} (-2)^{2x^2-x} = ?$

Yanıt / The Answer is 64

59. $\lim_{x\to 4} \left[\left(\log_3(2x^2-x-1)\right)\right] = ?$

Yanıt / The Answer is 3

60. $\lim_{x\to 3} \left[\log_2(5x^2) - \log_2(x^2)\right] = ?$

Yanıt / The Answer is $\log_2^5$

61. $\lim_{x\to\infty} (\ln|x+1| + \ln|x-1|) = ?$

Yanıt / The Answer is ∞

62. $\lim_{x\to\infty} (\ln|2x| - \ln|2x^2|) = ?$

Yanıt / The Answer is 0

63. $\lim_{x\to 5} e^{2x^2+1} = ?$

Yanıt / The Answer is e^{51}

64. $\lim_{x\to -\infty} e^{\frac{1}{2x^2+1}} = ?$

Yanıt / The Answer is 1

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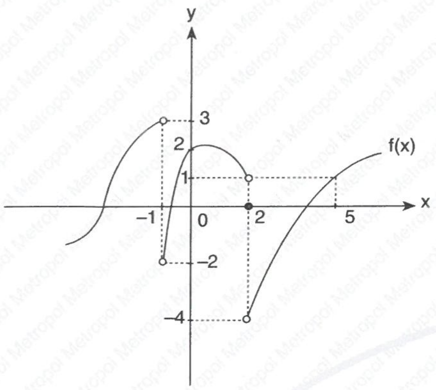
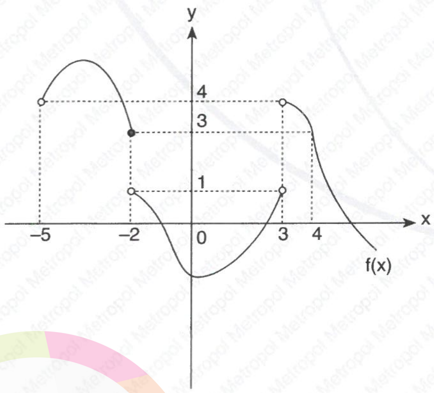
1.



$\Rightarrow \lim\limits_{x \to -1^-} f(x) + \lim\limits_{x \to 0^+} f(x) + \lim\limits_{x \to 2^+} f(x) + \lim\limits_{x \to 5} f(x) = ?$

A) − 2 B) − 1 C) 0 D) 1 E) 2

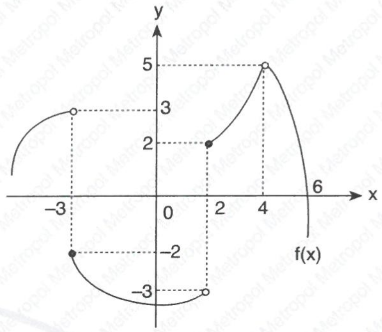
2.



$\Rightarrow \lim\limits_{x \to -5^+} f(x) + \lim\limits_{x \to -2^+} f(x) + \lim\limits_{x \to 3^-} f(x) + \lim\limits_{x \to 4} f(x) = ?$

A) −3 B) 0 C) 3 D) 6 E) 9

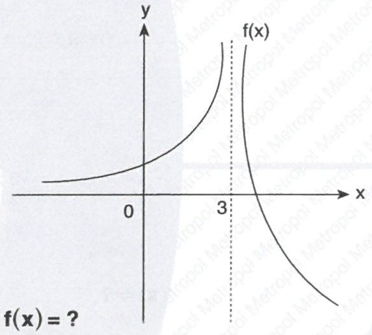
3.



$\Rightarrow \lim\limits_{x \to -3^+} f(x) + \lim\limits_{x \to 4} f(x) - \lim\limits_{x \to -3^-} f(x) = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

4.



$\Rightarrow \lim\limits_{x \to 3} f(x) = ?$

A) $-\infty$ B) 0 C) 3 D) $+\infty$ E) Limit yoktur./ Limit does not exist.

5.

$$f(x) = \begin{cases} x^2 + 3, & x > 0 \\ 2x + 1, & x = 0 \\ 3x + 7, & x < 0 \end{cases}$$

$\Rightarrow \lim\limits_{x \to -1} f(x) = ?$

A) 4 B) 8 C) 12 D) 16 E) 20

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6. $f(x)=\begin{cases}2x-1, & x\geq 3\\ 5x+1, & x<3\end{cases} \Rightarrow \lim\limits_{x\to 3^-} f(x)+\lim\limits_{x\to 3^+} f(x)=?$

A) 5 B) 8 C) 14 D) 17 E) 21

7. $f(x)=\begin{cases}1-x^3, & x<3\\ 2x+1, & 3\leq x\end{cases} \Rightarrow \lim\limits_{x\to 3} f(x)=?$

A) –26 B) –8 C) –7
D) 7 E) Limit yoktur./ Limit does not exist.

8. $f(x)=\begin{cases}3x+\dfrac{2}{x}, & 0<x\\ \ln x, & x>0\end{cases} \Rightarrow \lim\limits_{x\to 0} f(x)=?$

A) $-\infty$ B) –1 C) 0
D) Limit yoktur./ Limit does not exist. E) $+\infty$

9. $f(x)=\begin{cases}2x+a, & x>1\\ 7, & x=1\\ 3x-b, & x<1\end{cases}$

$\lim\limits_{x\to 1} f(x)=c, c\in R \Rightarrow$ **a + b = ?**

A) –1 B) 0 C) 1 D) 3 E) 5

10. $f(x)=\begin{cases}x-|x-2|, & x<2\\ 2x-1, & x=2\\ 2-\log_2(x^3-4), & x>2\end{cases}$

$\Rightarrow \lim\limits_{x\to 2^-} f(x)+\lim\limits_{x\to 2^+} f(x)=?$

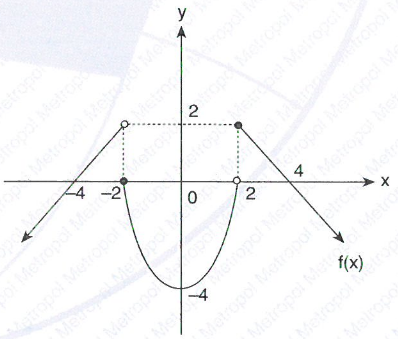
A) –2 B) –1 C) 0 D) 1 E) 2

11. $f(x)=\begin{cases}x^2+b, & x<2\\ ax+3, & 2<x\end{cases}$

$\lim\limits_{x\to 2} f(x)=7 \Rightarrow$ **3a – b = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

12.



$\Rightarrow \lim\limits_{x\to 0} f(x)+\lim\limits_{x\to 2^+} f(x)+\lim\limits_{x\to -2^-} f(x)=?$

A) –4 B) –2 C) 0 D) 2 E) 4

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
E	E	A	D	A	E	E	D	C	E	C	C

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1. $\lim\limits_{x \to 1} (x^2 - x + 1) = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

2. $\lim\limits_{x \to 3} (x^2 - 3x + 5) = ?$

A) 9 B) 5 C) 3 D) 2 E) 1

3. $\lim\limits_{y \to 4} \sqrt{y^2 + y + 5} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

4. $\lim\limits_{x \to 0} \dfrac{x^2 - 1}{7 - 2x + 8x^2} = ?$

A) –8 B) $-\frac{8}{7}$ C) $-\frac{1}{7}$ D) $\frac{1}{7}$ E) – 1

5. $\lim\limits_{x \to 1} \dfrac{x^2 - 3x + 1}{x^2 + 1} = ?$

A) $\frac{1}{2}$ B) 2 C) –2 D) $-\frac{1}{2}$ E) – 4

6. $\lim\limits_{h \to 0} \dfrac{h}{h^2 - 7h + 1} = ?$

A) 7 B) 4 C) 1 D) 0 E) ∞

7. $\lim\limits_{x \to a} f(x) = -2$ ve (and) $\lim\limits_{x \to a} g(x) = 3$

$\Rightarrow \lim\limits_{x \to a} \dfrac{2f(x) - g(x)}{g^2(x)} = ?$

A) $-\frac{9}{7}$ B) $-\frac{7}{9}$ C) $-\frac{8}{9}$ D) $-\frac{7}{8}$ E) $-\frac{7}{2}$

8. $\lim\limits_{x \to 0} \dfrac{x^3 + 2x^2 + x}{x^3 + x + 1} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

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9. $\lim\limits_{x \to 6}\left(\log_{\frac{1}{5}}(x-5)\right) = ?$

A) 5 B) –5 C) 0 D) 6 E) 12

10. $\lim\limits_{x \to 2}[\ln(x+1)] = A \Rightarrow e^{A} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

11. $\lim\limits_{x \to k}[f(x)-g(x)] = 10$,

$\lim\limits_{x \to k}[f(x)+g(x)] = 8$

$\Rightarrow \lim\limits_{x \to k}[f(x) \cdot g(x)] = ?$

A) –9 B) –5 C) –1 D) 5 E) 9

12. $f(x) = (x^2-x-1)^2$, $g(x) = (x-1)^2+1 \Rightarrow \lim\limits_{x \to 1}[f(x)+g(x)] = ?$

A) –1 B) 0 C) 1 D) 2 E) 3

13. $\lim\limits_{x \to 0}\dfrac{5x+4}{x^2+x} = ?$

A) $-\infty$ B) –1 C) 0 D) 1 E) ∞

14. $\lim\limits_{x \to \infty}\left(\dfrac{4}{5}\right)^{x+1} = ?$

A) $-\infty$ B) –1 C) 0 D) 1 E) ∞

15. $\lim\limits_{x \to \infty}\left(5^{x}+\dfrac{12}{x}+12^{1/x}\right) = ?$

A) $-\infty$ B) –1 C) 0 D) 1 E) ∞

16. $\lim\limits_{x \to 0^-}\dfrac{x-2}{x^5} = ?$

A) $-\infty$ B) –1 C) 0 D) 1 E) ∞

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	B	D	C	D	D	B	C
9	10	11	12	13	14	15	16
C	C	A	D	E	C	E	E

1. $\lim_{x \to 7} (\sqrt{x+2} - \sqrt{11-x}) = ?$

A) 3 B) 2 C) 1 D) –1 E) –3

2. $\left.\begin{array}{l} f(x) = x^3 - 3x + 4 \\ g(x) = x^3 - 5 \end{array}\right\} \Rightarrow \lim_{x \to 2} \dfrac{2 \cdot f(x)}{g(x)} = ?$

A) 12 B) 8 C) 4 D) 2 E) 1

3. $\lim_{x \to 8} \left[\log_3(x^2 - 2x - 3) - \log_9(x^2 - 6x + 9)\right] = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

4. $\lim_{x \to 1} \dfrac{2x^2 - ax + 4}{4x + 1} = 4 \Rightarrow a = ?$

A) –28 B) –14 C) –7 D) 7 E) 14

5. $\lim_{x \to \frac{\pi}{3}} \dfrac{2\tan^2 x - 1}{2\cos x + 3} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{3}{4}$ D) 1 E) $\frac{5}{4}$

6. $\lim_{x \to \frac{\pi}{3}} \sec x = ?$

A) $\frac{2}{\sqrt{3}}$ B) $-\frac{2}{\sqrt{3}}$ C) –2 D) 2 E) 1

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7. $\lim\limits_{x \to 2^+} \frac{|x-2|}{x^2-4} = ?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{8}$ E) $\frac{1}{16}$

8. $\lim\limits_{x \to 5^+} \frac{|x-5|}{x^2-25} = ?$

A) $\frac{1}{5}$ B) $\frac{1}{10}$ C) $\frac{1}{20}$ D) $\frac{1}{25}$ E) $\frac{1}{30}$

9 $\lim\limits_{x \to 1^+} \frac{3x-3}{|1-x|} = ?$

A) 1 B) 3 C) 5 D) –1 E) –3

10. $\lim\limits_{y \to 3^+} \frac{|x-3|+3x-9}{x^2-3x-4} = ?$

A) 0 B) 4 C) 3 D) 7 E) 9

11. $\lim\limits_{x \to 3^+} \frac{|x|}{|9-3x|} = ?$

A) $-\infty$ B) 3 C) 1 D) –3 E) ∞

12. $\lim\limits_{x \to 2} \frac{|2x-4|}{x-2} = ?$

A) 2 B) 0 C) –2 D) –1 E) Limit yoktur./ Limit does not exist.

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
C	C	A	B	E	D	C	B	B	A	E	E

1. $\lim\limits_{x \to 2} \dfrac{x^2-4}{x^3-8} = ?$

A) $\frac{1}{3}$ B) 3 C) $\frac{1}{9}$ D) 9 E) 12

2. $\lim\limits_{y \to x} \dfrac{x^2-y^2}{y-x} = ?$

A) –x B) –y C) 2x D) –2x E) –2y

3. $\lim\limits_{x \to 2} \sqrt{\dfrac{x^4-16}{x^3-8}} = ?$

A) $\sqrt{6}$ B) $\sqrt{3}$ C) $2\sqrt{6}$ D) $\frac{2\sqrt{6}}{3}$ E) $-\frac{2\sqrt{6}}{3}$

4. $\lim\limits_{y \to 2} \sqrt{\dfrac{y^2-4}{y^2-3y+2}} = ?$

A) 4 B) 8 C) 2 D) 16 E) 9

5. $\lim\limits_{x \to 1} \dfrac{x^3-1}{x-1} = ?$

A) 9 B) 6 C) 3 D) 2 E) 1

6. $\lim\limits_{\theta \to 2} \sqrt{\dfrac{\theta^3-8}{\theta^2-4}} = ?$

A) $\sqrt{21}$ B) $\sqrt{19}$ C) $\sqrt{7}$ D) $\sqrt{3}$ E) $\sqrt{2}$

7. $\lim\limits_{x \to -1} \dfrac{x^3+1}{x+1} = ?$

A) 1 B) 3 C) 5 D) 7 E) 9

8. $\lim\limits_{x \to -2} \dfrac{x^2+2x}{x+2} = ?$

A) –4 B) –3 C) –2 D) –1 E) 0

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9. $\lim\limits_{x \to 2} \dfrac{x^3-8}{x-2} = ?$

A) 15 B) 12 C) 9 D) 6 E) 3

10. $\lim\limits_{y \to b} \dfrac{y\sqrt{y}-b\sqrt{b}}{\sqrt{y}-\sqrt{b}} = ?$

A) 3y B) 3b C) –3y D) –3b E) –b

11. $\lim\limits_{h \to 0} \dfrac{(x+h)^2-x^2}{h} = ?$

A) 2 B) x C) 2x D) 4x E) 8x

12. $\lim\limits_{x \to 2} \dfrac{x^2-x-2}{x-2} = ?$

A) 9 B) 8 C) 5 D) 4 E) 3

13. $\lim\limits_{x \to 3^+} f(x) = 1$ ve (and) $\lim\limits_{x \to 3^-} f(x) = 2$

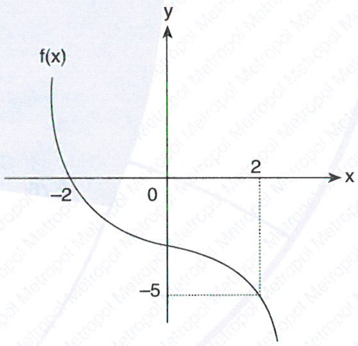
$\Rightarrow \lim\limits_{x \to 2^+} \dfrac{f(2x-1)+f(5-x)}{f(x^2-1)} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

14. $\lim\limits_{x \to 0^+} \left(3^{-\frac{1}{x}} + 2^x - \dfrac{4}{5^{-x}} - 1\right) = ?$

A) –5 B) –4 C) –3 D) 1 E) 2

15.



$\Rightarrow \lim\limits_{x \to 2} \dfrac{(f(x))^2+7\cdot f(x)+10}{f(x)+5} = ?$

A) 1 B) 0 C) –1 D) –2 E) –3

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	D	D	C	C	D	B	C
9	10	11	12	13	14	15	
B	B	C	E	C	B	E	

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BÖLÜM CHAPTER 12

TARİHSEL NOT / HISTORICAL NOTE

ÖMER HAYYAM [1048 – 1131]

İranlı şair, filozof, matematikçi ve astronom. Hayyam, üçüncü dereceden bilinmeyen denklemlerle ilgili yazdığı bir eserinde bilinmeyen rakamın yerine Arapça'da "şey" anlamına gelen kelimeyi kullanmıştır. Daha sonra bu eseri diğer dillere çevrilirken İspanyolcaya "Xay" olarak geçmiştir. Daha sonra bu kelime ilk harfine indirgenerek bilinmeyen rakamın simgesi "x" olarak kullanılmaya başlamıştır. Binom açılımını ilk kullanan bilim insanıdır.

Iranian poet, philosopher, mathematician and astronomer. Khayyam, in a book he wrote about the equations of the third degree unknowns, used the word "thing" in Arabic instead of the unknown figure. Later this work was translated into other languages and passed to Spanish as "Xay". Then this word is reduced to the first letter of the unknown number "x" as the symbol began to be used. He is the first scientist to use binomial expansion.

LİMİTTE BELİRSİZLİKLER
INDETERMINATE FORMS

Bu bölüm 48 alıştırma sorusu, 120 test sorusu, 14 YÖS sorusu içermektedir.

This chapter includes 48 exercise questions, 120 test questions, and 14 YÖS questions.

BÖLÜM / CHAPTER 12

LİMİTTE BELİRSİZLİKLER / INDETERMINATE FORMS

- Limitte Belirsizlikler / Indeterminate Forms .... 317 – 340

BÖLÜM 12 CHAPTER

LİMİTTE BELİRSİZLİKLER
INDETERMINATE FORMS

1. $\lim\limits_{x \to 1} \dfrac{x^2-1}{x-1} = ?$

Yanıt / The Answer is 2

2. $\lim\limits_{x \to 1} \dfrac{x-1}{x^2-6x+5} = ?$

Yanıt / The Answer is $-\frac{1}{4}$

3. $\lim\limits_{x \to -1} \dfrac{x^3+1}{x^2-1} = ?$

Yanıt / The Answer is $-\frac{3}{2}$

4. $\lim\limits_{x \to a} \dfrac{x^2-a^2}{x-a} = ?$

Yanıt / The Answer is 2a

5. $\lim\limits_{x \to 4} \dfrac{2x^3-8x^2}{x-4} = ?$

Yanıt / The Answer is 32

6. $a, b \in R$,

$\lim\limits_{x \to 2} \dfrac{x^2+a}{2x-4} = b \Rightarrow$ **a = ?**

Yanıt / The Answer is – 4

7. $\lim\limits_{x \to 1} \dfrac{3x-k}{x-1} = m, \ (k, m \in R) \Rightarrow$ **k = ?**

Yanıt / The Answer is 3

8. $\lim\limits_{x \to 1} \dfrac{x^2-ax-5}{x-1} = b \Rightarrow$ **a + b = ?**

Yanıt / The Answer is 2

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9. $a, b \in \mathbb{R}$,

$\lim_{x \to 1} \frac{x^2 + x + a}{x - 1} = b \Rightarrow$ **a + b = ?**

Yanıt / The Answer is 1

10. $k, m \in \mathbb{R}$,

$\lim_{x \to 2} \frac{2x - \sqrt{x + k}}{x^2 - 4} = m \Rightarrow$ **k = ?**

Yanıt / The Answer is 14

11. $\lim_{x \to 3} \frac{x^3 - 3x^2 + 3x - 9}{x^3 - 3x^2 - x + 3} = ?$

Yanıt / The Answer is $\frac{3}{2}$

12. $\lim_{x \to 0} \frac{\sin 5x}{3x} = ?$

Yanıt / The Answer is $\frac{5}{3}$

13. $\lim_{x \to 0} \frac{\tan 5x}{3x} = ?$

Yanıt / The Answer is $\frac{5}{3}$

14. $\lim_{x \to 0} \frac{3x}{\tan 6x} = ?$

Yanıt / The Answer is $\frac{1}{2}$

15. $\lim_{x \to 2} \frac{\sin(x - 2)}{x - 2} = ?$

Yanıt / The Answer is 1

16. $\lim_{x \to -1} \frac{2x + 2}{\tan(3x + 3)} = ?$

Yanıt / The Answer is $\frac{2}{3}$

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17. $\lim_{x \to 0} \dfrac{\tan 6x + \sin 8x}{2x} = ?$

Yanıt / The Answer is 7

18. $\lim_{x \to \infty} \dfrac{\sin \frac{3}{x}}{\frac{6}{x}} = ?$

Yanıt / The Answer is $\frac{1}{2}$

19. $\lim_{x \to 4} \dfrac{\sin(2x-8)}{x-4} = ?$

Yanıt / The Answer is 2

20. $\lim_{x \to 2} \dfrac{x-2}{\tan(x^2-4)} = ?$

Yanıt / The Answer is $\frac{1}{4}$

21. $\lim_{x \to 0} \dfrac{3x^2}{\sin^2 x} = ?$

Yanıt / The Answer is 3

22. $\lim_{x \to 0} \dfrac{\sin^3 4x}{\tan^3 2x} = ?$

Yanıt / The Answer is 8

23. $\lim_{x \to 0} \dfrac{5x - \sin ax}{\tan x} = 4 \Rightarrow a = ?$

Yanıt / The Answer is 1

24. $\lim_{x \to \frac{\pi}{4}} \dfrac{\cos 2x}{\sin x - \cos x} = ?$

Yanıt / The Answer is $-\sqrt{2}$

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25. $\lim\limits_{x \to -\infty} \dfrac{5x^3+5}{x-2} = ?$

Yanıt / The Answer is ∞

26. $\lim\limits_{x \to -\infty} \dfrac{2x+1}{x^2+2x+1} = ?$

Yanıt / The Answer is 0

27. $\lim\limits_{x \to \infty} \dfrac{3x+4}{4x-1} = ?$

Yanıt / The Answer is $\dfrac{3}{4}$

28. $\lim\limits_{x \to \infty} \dfrac{4x^2-2x+1}{-2x^2+x+1} = ?$

Yanıt / The Answer is -2

29. $\lim\limits_{x \to \infty} \dfrac{3x^3-2x^2+1}{x^4-3x^2-2} = ?$

Yanıt / The Answer is 0

30. $\lim\limits_{x \to \infty} \dfrac{-7x^4-3x^3+2x^2+1}{3x^4+2x^3-x^2-1} = ?$

Yanıt / The Answer is $-\dfrac{7}{3}$

31. $\lim\limits_{x \to \infty} \dfrac{(x-3)^2}{2x^2-x} = ?$

Yanıt / The Answer is $\dfrac{1}{2}$

32. $\lim\limits_{x \to -\infty} \dfrac{(x+1)^2 \cdot (2x+1)^3}{2x^5} = ?$

Yanıt / The Answer is 4

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33. $\lim_{x\to\infty} \dfrac{(a-2)x^2+x+1}{-3x+1} = -\dfrac{1}{3} \Rightarrow a = ?$

Yanıt / The Answer is 2

34. $\lim_{x\to\infty} \dfrac{(k-2)x^3+(m+1)x^2-4x+1}{2x^2-1} = 3 \Rightarrow k+m = ?$

Yanıt / The Answer is 7

35. $\lim_{x\to\infty} \dfrac{2\cdot 2^x+4\cdot 3^x}{3^x+2\cdot 2^x} = ?$

Yanıt / The Answer is 4

36. $\lim_{x\to\infty} \dfrac{3\pi^x+2e^x}{3e^x-\pi^x} = ?$

Yanıt / The Answer is –3

37. $\lim_{x\to\infty} \dfrac{x+\sqrt{x^2+4}}{3x+\sqrt{x^2+2x+1}} = ?$

Yanıt / The Answer is $\frac{1}{2}$

38. $\lim_{x\to-\infty} \dfrac{6x-\sqrt{x^2+1}}{2x} = ?$

Yanıt / The Answer is $\frac{7}{2}$

39. $\lim_{x\to\infty} \left[\log_2\sqrt{x+3}-\log_2\sqrt{4x+1}\right] = ?$

Yanıt / The Answer is –1

40. $\lim_{x\to\infty} \left(\sqrt{16x^2-4x+1}-4x\right) = ?$

Yanıt / The Answer is $-\frac{1}{2}$

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41. $\lim\limits_{x\to\infty}\left(x\cdot\sin\frac{10}{x}\right)=?$

Yanıt / **The Answer is** 10

42. $\lim\limits_{x\to 0}(4x\cdot\cot x)=?$

Yanıt / **The Answer is** 4

43. $\lim\limits_{x\to 0}(1+3x)^{\frac{1}{x}}=?$

Yanıt / **The Answer is** e^3

44. $\lim\limits_{x\to\infty}\left(1+\frac{x-1}{2x^2+1}\right)^{4x-1}=?$

Yanıt / **The Answer is** e^2

45.
$$f(x)=\begin{cases}2x^2-3, & x<-2\\ ax+b, & -2\leqslant x<1\\ 4-3x, & x\geqslant 1\end{cases}$$

fonksiyonu $\forall x\in R$ için sürekli ise 3b – 3a = ?

If the function is continuous for $\forall x\in R$, is 3b – 3a = ?

Yanıt / **The Answer is** 11

46.
$$f(x)=\begin{cases}\frac{\sin 2x}{3x}, & x>0\\ a+2, & x=0\\ 2x-3b, & x<0\end{cases}$$

fonksiyonu $\forall x\in R$ için sürekli ise a+b = ?

If the function is continuous for $\forall x\in R$, is a+b = ?

Yanıt / **The Answer is** $-\frac{14}{9}$

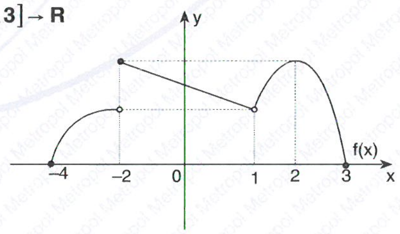
47.
$$f(x)=\begin{cases}x-4, & x<3\\ \operatorname{sgn}(a^2-a-12), & x=3\\ 2x-7, & x>3\end{cases}$$

fonksiyonu x = 3 için sürekli ise $\sum a=?$

If the function is continuous x=3, $\sum a=?$

Yanıt / **The Answer is** 3

48. $f:[-4,3]\to R$



fonksiyonu kaç tam sayı için süreklidir?

For how many integers the function is continuous?

Yanıt / **The Answer is** 4

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1. $\lim_{x \to \frac{\pi}{4}} (\cos 2x + \tan 3x - \sin 2x) = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

2. $\lim_{x \to 0} \frac{\sin 5x}{3x} = ?$

A) $\frac{3}{4}$ B) $\frac{5}{3}$ C) 1 D) $-\frac{3}{5}$ E) – 1

3. $\lim_{x \to \pi} \frac{\sin 3x}{\sin x} = ?$

A) 3 B) 1 C) 0 D) π E) 3π

4. $\lim_{x \to 0} \frac{\tan 3x + \sin 2x}{5x} = ?$

A) $\frac{1}{3}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) 1 E) $\frac{6}{5}$

5. $\lim_{x \to 0} \frac{\tan 2x}{\sin 7x} = ?$

A) $\frac{7}{2}$ B) $\frac{2}{7}$ C) 0 D) $\frac{2x}{7}$ E) $\frac{7}{2x}$

6. $\lim_{x \to 0} \left(\frac{\sin 3x + \tan 5x}{2x}\right) = ?$

A) $\frac{3}{2}$ B) 2 C) $\frac{5}{2}$ D) 3 E) 4

7. $\lim_{x \to 2} \frac{\tan(x-2)}{x-2} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

8. $\lim_{x \to 2} \frac{x^2 - 4}{\sin(x-2)} = ?$

A) –2 B) 0 C) 2 D) 4 E) 6

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9. $\lim\limits_{x \to 2} \dfrac{\sin(2-x)}{x^2-4} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{8}$ C) $\frac{1}{16}$ D) $\frac{1}{32}$ E) $-\frac{1}{4}$

10. $\lim\limits_{x \to 3} \dfrac{\sin(3-x)}{x^2-9} = ?$

A) $-\frac{1}{9}$ B) $-\frac{1}{6}$ C) $-\frac{1}{3}$ D) $\frac{1}{3}$ E) $\frac{1}{6}$

11. $\lim\limits_{x \to 3} \dfrac{3x^2-27}{\sin(x-3)} = ?$

A) 0 B) 5 C) 9 D) 18 E) 23

12. $\lim\limits_{x \to 0} \dfrac{\sin x^4}{x^2} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

13. $\lim\limits_{x \to 0} \dfrac{\sin^3 3x}{8x^3} = ?$

A) $\frac{3}{8}$ B) $\frac{27}{5}$ C) $\frac{27}{8}$ D) $\frac{3}{2}$ E) $\frac{9}{8}$

14. $\lim\limits_{x \to \frac{\pi}{2}} \dfrac{1+\cos 2x}{\cos x} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

15. $\lim\limits_{x \to 0} \dfrac{x \cdot \sin x}{1-\cos x} = ?$

A) 1 B) 0 C) 2 D) –1 E) –2

16. $\lim\limits_{x \to 0^+} \left(\dfrac{\tan 5x \cdot \sin 2x}{9x^2}\right) = ?$

A) $\frac{9}{10}$ B) $\frac{10}{3}$ C) $\frac{10}{9}$ D) $\frac{3}{10}$ E) 0

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	B	A	D	B	E	B	D
9	10	11	12	13	14	15	16
E	B	D	A	C	C	C	C

1. $\lim\limits_{x \to 1} \dfrac{x^2-1}{x-1} = ?$

A) 0 B) 1 C) 2 D) 3 E) 5

2. $\lim\limits_{x \to 1} \dfrac{x^2-3x+2}{x^2-5x+4} = ?$

A) $-\frac{1}{3}$ B) 1 C) $\frac{1}{3}$ D) $\frac{1}{4}$ E) $\frac{1}{6}$

3. $\lim\limits_{x \to 2} \dfrac{x^3-3x^2+4}{x^3-5x^2+8x-4} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

4. $\lim\limits_{x \to 1} \dfrac{x^5-1}{x-1} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

5. $\lim\limits_{x \to 3} \dfrac{9-x^2}{x^3-27} = ?$

A) $\frac{1}{3}$ B) 0 C) $-\frac{1}{3}$ D) $-\frac{2}{9}$ E) $-\frac{1}{9}$

6. $\lim\limits_{x \to 2} \dfrac{x^4-16}{x^3-8} = ?$

A) $\frac{2}{3}$ B) $\frac{4}{3}$ C) $\frac{8}{3}$ D) $\frac{16}{3}$ E) 4

7. $\lim\limits_{x \to 16} \dfrac{2x-32}{\sqrt{x}-4} = ?$

A) 2 B) 4 C) 6 D) 8 E) 16

8. $\lim\limits_{x \to 9} \dfrac{x^2-81}{\sqrt{x}-3} = ?$

A) 27 B) 54 C) 81 D) 108 E) 121

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9. $\lim\limits_{x \to 1} \dfrac{\sqrt{x^3}-1}{x^2-1} = ?$

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) 1 E) $\frac{3}{2}$

10. $\lim\limits_{x \to 0} \dfrac{3x \cdot \sin x}{1-\cos x} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

11. $\lim\limits_{x \to 0} \dfrac{1-\cos x}{x^2} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) $\frac{\sqrt{2}}{2}$ E) $\frac{\sqrt{3}}{2}$

12. $\lim\limits_{x \to 0} \dfrac{1-\cos x}{3x^2} = ?$

A) $\frac{1}{9}$ B) $\frac{1}{6}$ C) $\frac{1}{3}$ D) 3 E) 6

13. $\lim\limits_{x \to \frac{\pi}{4}} \dfrac{\cos 2x}{\sin x-\cos x} = ?$

A) $-\sqrt{2}$ B) $-\frac{\sqrt{2}}{2}$ C) 0 D) $\frac{\sqrt{2}}{2}$ E) $\sqrt{2}$

14. $\lim\limits_{x \to 0} \dfrac{\cos 2x-1}{\tan x} = ?$

A) – 1 B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) 1

15. $\lim\limits_{x \to 5} \dfrac{\sin(\sqrt{x}-\sqrt{5})}{x-5} = ?$

A) $\sqrt{5}$ B) $\frac{\sqrt{5}}{5}$ C) 1 D) $\frac{\sqrt{5}}{10}$ E) $\frac{2\sqrt{5}}{5}$

16. $\lim\limits_{x \to 0} \dfrac{\sin 4x \cdot \tan 6x}{3x^2} = ?$

A) $\frac{5}{3}$ B) $\frac{10}{3}$ C) 4 D) 6 E) 8

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	C	C	D	D	C	E	D
9	10	11	12	13	14	15	16
C	E	B	B	A	C	D	E

1. $\lim\limits_{a \to b} \dfrac{2b^3 - 2a^3}{3a^2 - 3b^2} = ?$

A) –3b B) –2b C) –b D) 2b E) 3b

2. $\lim\limits_{x \to 2} \dfrac{3x^2 - x - 10}{x - 2} = ?$

A) 5 B) 6 C) 8 D) 9 E) 11

3. $\lim\limits_{x \to \frac{\pi}{2}} (\sec x - \tan x) = ?$

A) $-\infty$ B) –1 C) 0 D) 1 E) ∞

4. $\lim\limits_{x \to \infty} \left(\ln x \cdot \dfrac{1}{x}\right) = ?$

A) $-\infty$ B) –1 C) 0 D) 1 E) ∞

5. $\lim\limits_{x \to \infty} x \cdot \cos\dfrac{1}{x} = ?$

A) 1 B) ∞ C) 0 D) $-\infty$ E) –1

6. $\lim\limits_{x \to 0} \dfrac{1 - \cos x}{4x^2} = ?$

A) $\frac{1}{8}$ B) $\frac{1}{6}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

7. $\lim\limits_{x \to 0} \dfrac{\sqrt{1 - \cos 2x}}{3x} = ?$

A) $\frac{1}{\sqrt{3}}$ B) $\frac{\sqrt{2}}{\sqrt{3}}$ C) 1 D) $\frac{\sqrt{2}}{3}$ E) $\frac{2}{3}$

8. $\lim\limits_{x \to 0} \dfrac{x \cdot \cos x}{e^{2x} - 1} = ?$

A) $\frac{1}{2}$ B) $\frac{1}{2}$ C) 1 D) $\sqrt{2}$ E) 2

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9. $\lim\limits_{x\to\infty} 2x\cdot\tan\frac{1}{x} = ?$

A) –1 B) 0 C) $\frac{1}{2}$ D) 2 E) $\frac{3}{2}$

10. $\lim\limits_{x\to 0} x\cdot\cot 2x = ?$

A) 1 B) $\frac{1}{2}$ C) 2 D) 3 E) 4

11. $\lim\limits_{x\to \pi} \sin x\cdot\tan\frac{x}{2} = ?$

A) $\frac{1}{2}$ B) 1 C) 2 D) 0 E) $\frac{1}{3}$

12. $\lim\limits_{x\to\infty} 2x\cdot\sin\frac{3}{4x} = ?$

A) 0 B) $\frac{2}{3}$ C) 1 D) $\frac{3}{2}$ E) ∞

13. $\lim\limits_{x\to 0} \frac{2x-\sin 3x}{x+\tan x} = ?$

A) –1 B) $-\frac{1}{2}$ C) $-\frac{1}{3}$ D) $\frac{1}{2}$ E) $\frac{3}{2}$

14. $\lim\limits_{x\to 0} 5x\cdot\cot 3x = ?$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{3}{5}$ D) $\frac{3}{2}$ E) $\frac{5}{3}$

15. $\lim\limits_{x\to\infty} 4x\cdot\tan\frac{3}{x} = ?$

A) $\frac{3}{4}$ B) $\frac{4}{3}$ C) 6 D) 12 E) 18

16. $\lim\limits_{x\to \pi} (3x-3\pi)\cdot\cot x = ?$

A) –3 B) –1 C) 0 D) 1 E) 3

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	E	C	C	B	A	D	B
9	10	11	12	13	14	15	16
D	B	C	D	B	E	D	E

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1. $\lim_{x\to\infty} \frac{3x^2+1}{3x^2-1} = ?$

A) –1 B) –2 C) 0 D) 1 E) 2

2. $\lim_{x\to\infty} \frac{6x^2+4x-1}{3x^2+x-1} = ?$

A) 6 B) $\frac{4}{3}$ C) –6 D) $-\frac{1}{3}$ E) 2

3. $\lim_{x\to\infty} \frac{3x^2+3x}{2x^2+5x-1} = ?$

A) $\frac{2}{3}$ B) 0 C) $\frac{3}{5}$ D) –3 E) $\frac{3}{2}$

4. $\lim_{x\to\infty} \frac{3x^2+4x+5}{4x^2-3} = ?$

A) 1 B) $\frac{4}{3}$ C) $\frac{3}{4}$ D) 5 E) 2

5. $\lim_{x\to\infty} \frac{4x^3+x}{2x^3+3} = ?$

A) $\frac{1}{2}$ B) $\frac{4}{3}$ C) $\frac{1}{3}$ D) 0 E) 2

6. $\lim_{x\to\infty} \frac{3x^2-x+1}{3x^3+x^2-x} = ?$

A) ∞ B) 1 C) –1 D) $-\infty$ E) 0

7. $\lim_{x\to\infty} \frac{4x^4-6x^6}{2x^6+3x^4} = ?$

A) –3 B) –2 C) $\frac{4}{3}$ D) 2 E) 3

8. $\lim_{x\to\infty} \frac{1+3+5+\ldots+(2x-1)}{7x^2+1} = ?$

A) $-\frac{2}{7}$ B) $-\frac{1}{7}$ C) 1 D) $\frac{1}{7}$ E) $\frac{2}{7}$

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9. $\lim_{x\to\infty}\left(\log_2\left(\frac{2n^2-4n-8}{32n^2+16n+8}\right)\right)=?$

A) –4 B) $-\frac{1}{4}$ C) $\frac{1}{4}$ D) 4 E) 16

10. $\lim_{x\to\infty}\left(\log_2(8x^2-4x+1)-\log_2(x^2-1)\right)=?$

A) 8 B) 6 C) 4 D) 3 E) 1

11. $\lim_{x\to\infty}\frac{3^{x+1}+2\cdot 7^x}{3^x-5\cdot 7^x}=?$

A) $-\frac{2}{5}$ B) $-\frac{1}{5}$ C) $\frac{1}{3}$ D) 3 E) 5

12. $\lim_{x\to\infty}\frac{7^x-3^x+1}{7^{x+1}-3^x-1}=?$

A) $-\frac{2}{5}$ B) $-\frac{1}{5}$ C) $\frac{1}{7}$ D) 3 E) 5

13. $\lim_{x\to-\infty}\frac{5^x-3^{x+2}}{5^x+3^{x-2}}=?$

A) –81 B) –9 C) 9 D) 27 E) 81

14. $\lim_{n\to\infty}(27)^{\frac{2n-1}{3n+1}}=?$

A) 1 B) 3 C) 9 D) 27 E) ∞

15. $\lim_{x\to\infty}\frac{6e^x+3\pi^x}{3e^x+\pi^x}=?$

A) 2 B) 3 C) 4 D) 5 E) 6

16. $\lim_{x\to\infty}\frac{\sin\frac{2}{x}}{\sin\frac{1}{x}}=?$

A) 0 B) $\frac{1}{4}$ C) $\frac{1}{2}$ D) 3 E) 2

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	E	E	C	E	E	A	D
9	10	11	12	13	14	15	16
A	D	A	C	A	C	B	E

1. $\lim\limits_{x\to\infty}\left(\sqrt{x^2+6x}-\sqrt{x^2-6x}\right)=?$

A) 0 B) ∞ C) –6 D) $-\infty$ E) 6

2. $\lim\limits_{x\to\infty}\left(\sqrt{x^2-2x-1}-\sqrt{x^2-7x+3}\right)=?$

A) $\frac{1}{2}$ B) $\frac{3}{2}$ C) $\frac{5}{2}$ D) $\frac{7}{2}$ E) $\frac{9}{2}$

3. $\lim\limits_{x\to\infty}\left(\sqrt{4x^2+2x-5}-\sqrt{4x^2+5x+2}\right)=?$

A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) $-\frac{3}{4}$ D) -1 E) -2

4. $\lim\limits_{x\to-\infty}\left(\sqrt{x^2+2x-4}+x\right)=?$

A) 1 B) ∞ C) –1 D) $-\infty$ E) 0

5. $\lim\limits_{x\to\infty}\sqrt{x^2+2x}-x=?$

A) 1 B) 3 C) 5 D) 6 E) 7

6. $\lim\limits_{x\to-\infty}\left(\sqrt{9x^2-x+5}+3x\right)=?$

A) $-\frac{1}{6}$ B) $-\frac{1}{4}$ C) 0 D) $\frac{1}{4}$ E) $\frac{1}{6}$

7. $\lim\limits_{x\to\infty}\left(\sqrt{x^2-3x+1}-x+4\right)=?$

A) $\frac{5}{2}$ B) 3 C) $\frac{7}{2}$ D) 4 E) $\frac{9}{2}$

8. $\lim\limits_{x\to\infty}\dfrac{\sqrt{x^2+5x+6}+\sqrt{9x^2+5}}{5x-21}=?$

A) $-\infty$ B) $-\frac{4}{5}$ C) 0 D) $\frac{4}{5}$ E) ∞

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9. $\lim\limits_{x\to\infty} \dfrac{\sqrt{9x^2-5x+4}+\sqrt{4x^2+3x-1}}{2x-3} = ?$

A) $\frac{3}{2}$ B) 2 C) $\frac{5}{2}$ D) 3 E) $\frac{7}{2}$

10. $\lim\limits_{x\to\infty} \dfrac{\sqrt{x^2+4x-1}+\sqrt{9x^2-3x+2}}{x+5} = ?$

A) –4 B) –2 C) 2 D) 3 E) 4

11. $\lim\limits_{x\to\infty} \dfrac{(m-5)x^2+(n+3)x-6}{x+4} = 0$

$\Rightarrow$ $m \cdot n = ?$

A) –15 B) –8 C) 2 D) 8 E) 15

12. $\lim\limits_{x\to\infty} \dfrac{(m-5)x^3+(2n+3)x^2-2x+1}{(5n-3)x^2+4x+3} = \dfrac{1}{3}$

$\Rightarrow$ $m - n = ?$

A) –7 B) –5 C) 5 D) 7 E) 17

13. $\lim\limits_{x\to\infty} \left(\dfrac{(a-2)x^3+(3b-6)x^2+x+6}{bx^2-5x+15}\right) = 1 \Rightarrow a+b = ?$

A) 0 B) 3 C) 5 D) 7 E) 9

14. $\lim\limits_{x\to 2} \dfrac{x^2+ax+6}{x-2} = 10 \Rightarrow a = ?$

A) –5 B) –3 C) 3 D) 4 E) 5

15. $n \in R$,

$\lim\limits_{x\to 2} \dfrac{2x-\sqrt{3x+m}}{x^2-4} = n \Rightarrow m = ?$

A) 4 B) 6 C) 8 D) 10 E) 12

16. $\lim\limits_{x\to-\infty} \left(\dfrac{x^2}{x-1} - \dfrac{x^3}{x^2+1}\right) = ?$

A) $-\infty$ B) –1 C) 0 D) 1 E) ∞

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	C	C	C	A	E	A	D
9	10	11	12	13	14	15	16
C	E	A	E	C	A	D	D

1. $\lim\limits_{x \to 0} \left(1 + \frac{1}{x}\right)^{\frac{1}{x}} = ?$

A) $-\infty$ B) -1 C) 0 D) 1 E) ∞

2. $\lim\limits_{x \to 0} (1 + 2x)^{\frac{1}{x}} = ?$

A) e^2 B) e^4 C) e^{-2} D) e^{-4} E) e^{-8}

3. $\lim\limits_{x \to 0} (1 + 2\sin x)^{\frac{1}{x}} = ?$

A) e B) e^2 C) e^3 D) e^4 E) e^5

4. $\lim\limits_{x \to 0} (1 + 6\tan x)^{\frac{1}{2x}} = ?$

A) e^4 B) e^3 C) e^2 D) e E) e^{-1}

5. $\lim\limits_{x \to \infty} \left(1 + \frac{x-1}{2x^2+1}\right)^{3x-1} = ?$

A) e B) $\sqrt{e}$ C) $e\sqrt{e}$ D) $e^2 \cdot \sqrt{e}$ E) e^3

6. $\lim\limits_{x \to \infty} \left(\frac{2x+6}{2x+1}\right)^{4x+3} = ?$

A) e^5 B) e^6 C) e^8 D) e^{10} E) e^{12}

7. $\lim\limits_{x \to \infty} \left(\frac{4x+3}{4x+5}\right)^{12x+3} = ?$

A) e^{-8} B) e^{-6} C) e^6 D) e^{12} E) ∞

8. $\lim\limits_{x \to -\infty} \left(\frac{x^2+2x}{x^2+x}\right)^{x^2} = ?$

A) 0 B) 1 C) e D) e^{-1} E) ∞

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9. $\lim_{x\to\infty}\left(\dfrac{-3x^4+x^3+5}{-3x^4+2x-1}\right)^{4x}=?$

A) $e^{-\frac{4}{3}}$ B) $e^{-\frac{3}{4}}$ C) e^{-1} D) $e^{\frac{3}{4}}$ E) $e^{\frac{4}{3}}$

10. $\lim_{x\to\infty}\left(\dfrac{x+3}{x}\right)^{x}=?$

A) e^{-3} B) e^{-1} C) e D) e^2 E) e^3

11. $\lim_{x\to 0}(e^x+x)^{\frac{1}{x}}=?$

A) 1 B) e C) e^2 D) e^4 E) ∞

12. $\lim_{x\to 0}(e^x+2x)^{\frac{2}{x}}=?$

A) e^2 B) e^4 C) e^6 D) e^9 E) e^{12}

13. $\lim_{x\to\infty}\left[\ln\left(\dfrac{x+3}{x}\right)^{2x}\right]=?$

A) 3 B) 5 C) 6 D) e^3 E) e^6

14. $\lim_{x\to 1} x^{\left(\frac{1}{x-1}\right)}=?$

A) 0 B) $\frac{1}{e}$ C) 1 D) e E) ∞

15. $\lim_{x\to 0}(\cos 2x)^{x}=?$

A) e^2 B) e C) 1 D) e^{-1} E) e^{-2}

16. $\lim_{x\to\infty}\left(\dfrac{2x+m}{2x-5}\right)^{3x+2}=e^6 \Rightarrow m=?$

A) –3 B) –1 C) 1 D) 2 E) 3

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	A	B	B	C	D	B	A
9	10	11	12	13	14	15	16
A	E	C	C	C	D	C	B

1.
$$f(x)=\begin{cases}2x+a, & x<1\\ 3, & x=1\\ 4x-1, & x>1\end{cases}$$

$\lim_{x\to 1} f(x)=f(1) \Rightarrow$ **a = ?**

A) –1 B) 0 C) 1 D) 2 E) 3

2.
$$f(x)=\begin{cases}mx^2+n, & x<2\\ n, & x=2\\ x+3, & x>2\end{cases}$$

$\lim_{x\to 2} f(x)=f(2) \Rightarrow$ **$m\cdot n$ = ?**

A) –5 B) –3 C) 0 D) 3 E) 5

3.
$$f(x)=\begin{cases}mx+n, & 1>x\\ 5, & x=1\\ x^2+m, & x>1\end{cases}$$

$\lim_{x\to x_0} f(x)=f(x_0), x_0\in R \Rightarrow$ **n = ?**

A) –2 B) –1 C) 1 D) 2 E) 4

4.
$$f(x)=\begin{cases}ax+b, & x=3\\ \dfrac{x^2-9}{3-x}, & x\neq 3\end{cases}$$

$\lim_{x\to x_0} f(x)=f(x_0),\ x_0\in R \Rightarrow$ **3a + b = ?**

A) –4 B) –5 C) –6 D) –7 E) –8

5. **f: R → R,**
$$f(x)=\begin{cases}ax-3, & x<3\\ 6, & x=3\\ 4x-b, & x>3\end{cases}$$

fonksiyonu $\forall x\in R$ için sürekli ise a+b=?

If the function is continuous for $\forall x\in R$, is a+b=?

A) 5 B) 6 C) 9 D) 12 E) 15

6.
$$f(x)=\begin{cases}\dfrac{x^2+3}{x-1}, & x<1\\ 2x+4, & 1\leq x<2\\ \dfrac{3x+1}{x^2-7x+12}, & x>2\end{cases}$$

fonksiyonu kaç noktada süreksizdir?

At how many points the function is discontinuous?

A) 1 B) 2 C) 3 D) 4 E) 5

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7. $f(x)=\begin{cases} \dfrac{1}{x^2-16}, & x<-1 \\ 2x, & -1\le x\le 3 \\ x^2-3, & x>3 \end{cases}$

fonksiyonu kaç noktada süreksizdir?

At how many points the function is discontinuous?

A) 1 B) 2 C) 3 D) 4 E) 5

8. $f(x)=\begin{cases} \log_2(x+4), & x>-2 \\ \dfrac{5}{x-x^2}, & x\le -2 \end{cases}$

fonksiyonu kaç noktada süreksizdir?

At how many points the function is discontinuous?

A) 1 B) 2 C) 3 D) 4 E) 5

9. $f(x)=|x-2|+\dfrac{x-1}{|x-3|}+\dfrac{3}{x^2-2x}$

fonksiyonu kaç noktada süreksizdir?

At how many points the function is discontinuous?

A) 1 B) 2 C) 3 D) 4 E) 5

10. $f(x)=\dfrac{x^2+3x+11}{x^2+(m-5)\cdot x+1}$

fonksiyonu $\forall x \in R$ için sürekli $\Rightarrow$? < m < ?

If the function is continuous for $\forall x \in R \Rightarrow$? < m < ?

A) $-2<m<-1$ B) $m\ge 3$ C) $3<m<7$ D) $m\le 5$ E) $-1<m\le 3$

11. $f(x)=\dfrac{\sqrt{x^2-x-2}}{x^2-9}$ **fonksiyonu kaç tam sayı için süreksizdir?**

At how many integers the function is discontinuous?

A) 1 B) 2 C) 3 D) 4 E) 5

12. $f(x)=\begin{cases} \dfrac{x-3}{x+2}, & x\le 0 \\ \sqrt{5-x}, & 0<x<8 \\ \dfrac{x}{x-30}, & x\ge 8 \end{cases}$

fonksiyonu kaç tam sayı için süreksizdir?

At how many integers the function is discontinuous?

A) 2 B) 3 C) 4 D) 5 E) 6

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
C	C	C	C	C	D	B	A	C	C	D	E

1. $f(x)=\begin{cases}\frac{|x-2|}{x-2}, & x\neq 2\\ 4, & x=2\end{cases}$

$\Rightarrow \lim\limits_{x\to 2} f(x) = ?$

A) –1 B) 1 C) 0 D) 4 E) Limit yoktur./ Limit does not exist.

2. $\lim\limits_{x\to -\pi^+} \dfrac{1+\tan 2x}{|\sin x - \cos x|} = ?$

A) –1 B) 0 C) 1 D) $-\infty$ E) ∞

3. $\lim\limits_{\left(\frac{x}{y}\right)\to 3} \dfrac{2x-5y}{3x+4y} = ?$

A) $-\frac{5}{3}$ B) $\frac{1}{2}$ C) $-\frac{5}{4}$ D) $\frac{2}{3}$ E) $\frac{1}{13}$

4. $f(x)=x^3-2x^2+mx-5,$

$\lim\limits_{x\to -2^-} f(x)=9 \Rightarrow \lim\limits_{x\to 1} f(x) = ?$

A) –21 B) –20 C) –19 D) –18 E) –17

5. $f(x)=x^2-8$

$\Rightarrow \lim\limits_{x\to 3^-} (f\circ f)(x) = ?$

A) –8 B) –7 C) –6 D) –5 E) –4

6. $\lim\limits_{x\to 1} \dfrac{(x+x^2+x^3+...+x^{20})-20}{(x+x^2+x^3+...+x^{10})-10} = ?$

A) 4 B) $\frac{42}{11}$ C) 3 D) $\frac{23}{11}$ E) 2

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7. $\lim\limits_{x \to 0} \dfrac{\cos 5x - \cos 3x}{\cos 3x - \cos x} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

8. $\lim\limits_{x \to 0^+} \dfrac{\arctan(x^2)}{1-\cos 2x} = ?$

A) $-\frac{1}{2}$ B) $\frac{1}{2}$ C) -1 D) 1 E) $\frac{1}{\sqrt{2}}$

9. $\lim\limits_{x \to \left(\frac{\pi}{2}\right)^-} \dfrac{1-\sin x}{\cot^2 x} = ?$

A) $-\frac{\pi}{2}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) $\frac{\pi}{2}$ E) ∞

10. $\lim\limits_{x \to 0} \dfrac{\sin 2x + \sin 3x + \cos 4x}{\tan 2x + \tan 3x + \cos 4x} = ?$

A) $\frac{7}{6}$ B) $\frac{6}{7}$ C) 1 D) $\frac{1}{4}$ E) $\frac{2}{3}$

11. $\lim\limits_{x \to \infty} \left(1+\frac{1}{x}\right)^x = e \Rightarrow \lim\limits_{x \to 0^+} \dfrac{\ln(1+x)}{x} = ?$

A) 1 B) 0 C) –1 D) $-\infty$ E) Limit yoktur./ Limit does not exist.

12. $f(x) = \begin{cases} \dfrac{ax+|x|}{x}, & x > 0 \\ \dfrac{2x-|x|}{x}, & x < 0 \end{cases}$

$\lim\limits_{x \to 0} f(x) \in \mathbb{R} \Rightarrow$ **a = ?**

A) 2 B) 1 C) 0 D) –1 E) –2

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
E	C	E	A	B	B	E	B	C	C	A	A

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1. $f(x) = 3x^2 - \sin x \cdot \cos x$

$\Rightarrow \lim_{h \to 0} \dfrac{f\left(\frac{\pi}{3}+h\right) - f\left(\frac{\pi}{3}\right)}{h} = ?$

A) $-\frac{1}{2}$ B) $\frac{1}{2}$ C) $\frac{4\pi-3}{2}$ D) 2π E) $\frac{4\pi+1}{2}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

2. $f(x) = \sin 3x - \tan 2x$

$\Rightarrow \lim_{h \to 0} \dfrac{f\left(\frac{\pi}{6}+h\right) - f\left(\frac{\pi}{6}\right)}{h} = ?$

A) -8 B) -4 C) $-\frac{8}{3}$ D) $-\frac{4}{3}$ E) -1

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

3. $\lim_{x \to -\infty} \dfrac{\sqrt{9x^2-6x+2}+2x}{7-x} = ?$

A) 1 B) 5 C) -1 D) 0 E) -5

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

4. $\lim_{x \to \frac{\pi}{2}} \dfrac{\cos x - \sin 4x}{\cot x} = ?$

A) -5 B) -3 C) 1 D) 3 E) 5

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

5. $f(x) = \begin{cases} \dfrac{3x}{x^2-16}, & x \le 2 \\ \dfrac{x-2}{x^2-5x+6}, & x > 2 \end{cases}$

fonksiyonu kaç noktada süreksizdir?

At how many points the function is discontinuous?

A) 1 B) 2 C) 3 D) 4 E) 5

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

6. $\lim_{x \to 0} x \cdot \cot 3x = ?$

A) 1 B) -1 C) 3 D) 0 E) $\frac{1}{3}$

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

7. $\lim_{x \to 1} \dfrac{\ln x}{x-1} = ?$

A) -1 B) 0 C) 1 D) 2 E) ln2

[İNÖNÜ ÜNİVERSİTESİ – YÖS 2018]

8. $f(x) = \begin{cases} x^2 - nx + m, & x \le n \\ mx, & x > n \end{cases}$

$\lim_{x \to n} f(x) = 2m - 8 \Rightarrow \dfrac{f(m)}{f(n)} = ?$

A) 1 B) 2 C) 4 D) 6 E) 8

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $\lim\limits_{x \to 64}\left(\dfrac{\sqrt{x}-\sqrt[3]{x}}{\sqrt[3]{x}-\sqrt[6]{x}}\right)=?$

A) 2 B) $\frac{3}{2}$ C) 1 D) $\frac{1}{2}$ E) $\frac{1}{6}$

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

10. $\lim\limits_{x \to -\infty}\left(\sqrt{x^2-3x}+5\right)=?$

A) 1 B) 5 C) $\frac{1}{5}$ D) $-\infty$ E) ∞

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

11. $\lim\limits_{x \to +\infty}\dfrac{e^x-1}{2x^2}=?$

A) 1 B) $\frac{e}{2}$ C) $\frac{1}{2}$ D) $-\infty$ E) ∞

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

12. $\lim\limits_{h \to 1}\dfrac{\sin(h-1)\cdot\cos(h-1)}{h^3-1}=?$

A) $-\frac{1}{3}$ B) $-\frac{1}{4}$ C) 0 D) $\frac{1}{4}$ E) $\frac{1}{3}$

[EGE ÜNİVERSİTESİ – YÖS 2016]

13. $\lim\limits_{x \to 0^+}\sqrt[x]{1-2x}=?$

A) e^{-2} B) e^{-1} C) e D) e^2 E) e^3

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

14. $\lim\limits_{x \to 0}\dfrac{\sin^3(2x)}{x^3}=?$

A) 1 B) 2 C) $\frac{1}{2}$ D) 0 E) 8

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

YANITLAR / ANSWERS

1	2	3	4	5	6	7
E	A	A	E	C	E	C
8	9	10	11	12	13	14
E	A	E	E	E	A	E

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BÖLÜM CHAPTER 13

TARİHSEL NOT / HISTORICAL NOTE

CARL FRİEDRİCH GAUSS (GAUß) [1777 –1855]

Alman matematikçi ve bilim insanı. Katkıda bulunduğu alanlardan bazıları; sayılar kuramı, analiz, diferansiyel geometri, jeodezi, elektrik, manyetizma, astronomi ve optiktir. "Matematikçilerin prensi" ve "antik çağlardan beri yaşamış en büyük matematikçi" olarak da anılan Gauss, matematiğin ve bilimin pek çok alanına etkisini bırakmıştır ve tarihin en nüfuzlu matematikçilerinden biri olarak kabul edilir.

German mathematician and scientist. Some of the areas where he participated are; numbers theory, analysis, differential geometry, geodesy, electricity, magnetism, astronomy and optics. Gauss, also known as "the prince of mathematicians" and "the greatest mathematician since antiquity period", has influenced many areas of mathematics and science and is considered one of the most influential mathematicians of history.

TÜREVİN TANIMI ve FONKSİYONLARIN TÜREVİ
DEFINITION of DERIVATIVE and DERIVATIVE of FUNCTIONS

Bu bölüm 128 alıştırma sorusu, 222 test sorusu içermektedir.

This chapter includes 128 exercise questions and 222 test questions.

BÖLÜM / CHAPTER 13

TÜREVİN TANIMI ve FONKSİYONLARIN TÜREVİ
DEFINITION of DERIVATIVE and DERIVATIVE of FUNCTIONS

- Türevin Tanımı ve Fonksiyonların Türevi / Definition of Derivative and Derivative of Functions. . . . . 343 – 386

BÖLÜM 13 CHAPTER

TÜREVİN TANIMI ve FONKSİYONLARIN TÜREVİ
DEFINITION of DERIVATIVE and DERIVATIVE of FUNCTIONS

1. $f(x) = -3x^2 - 3x \Rightarrow \lim_{x \to 1} \frac{f(x) - f(1)}{x - 1} = ?$

Yanıt / The Answer is -9

2. $f(x) = x^3 + 4x - 2 \Rightarrow \lim_{x \to 2} \frac{f(x) - f(2)}{x - 2} = ?$

Yanıt / The Answer is 16

3. $f(x) = 3x^3 - 2x^2 + x + 1 \Rightarrow \lim_{x \to -1} \frac{f(x) - f(-1)}{x + 1} = ?$

Yanıt / The Answer is 14

4. $f(x) = 2x^2 - x + 12 \Rightarrow \lim_{h \to 0} \frac{f(-1 + h) - f(-1)}{h} = ?$

Yanıt / The Answer is -5

5. $f(x) = x^2 - 4x + 4 \Rightarrow \lim_{x \to -3} \frac{f(x) - f(-3)}{x + 3} = ?$

Yanıt / The Answer is -10

6. $f(x) = x^6 \Rightarrow f'(x) = ?$

Yanıt / The Answer is $6.x^5$

7. $f(x) = 3x^{-2} \Rightarrow f'(x) = ?$

Yanıt / The Answer is $-6 \cdot x^{-3}$

8. $f(x) = \frac{1}{x} \Rightarrow f'(x) = ?$

Yanıt / The Answer is $-\frac{1}{x^2}$

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9. $f(x)=\frac{1}{2x^2} \Rightarrow f'(x)=?$

Yanıt / The Answer is $-\frac{1}{x^3}$

10. $f(x)=\sqrt{x} \Rightarrow f'(x)=?$

Yanıt / The Answer is $\frac{1}{2\sqrt{x}}$

11. $f(x)=-6x^{-5} \Rightarrow f'(x)=?$

Yanıt / The Answer is $30 \cdot x^{-6}$

12. $\frac{d(-8x^2)}{dx}=?$

Yanıt / The Answer is $-16x$

13. $y=5t^2 \Rightarrow \frac{dy}{dt}=?$

Yanıt / The Answer is $10t$

14. $f(t)=-t^3-4t+2 \Rightarrow \frac{df}{dt}=?$

Yanıt / The Answer is $-3t^2-4$

15. $y=x^3 \cdot (x+1) \Rightarrow y'=?$

Yanıt / The Answer is $4x^3+3x^2$

16. $f(x)=x^3+2x^2+x-4 \Rightarrow f'(0)=?$

Yanıt / The Answer is 1

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17. $f(x)=x^2-2x+16,\ f'(k)=f(2)\ \Rightarrow\ \mathbf{k=?}$

Yanıt / The Answer is **9**

18. $f(x)=3x^4+6\sqrt{x}-\frac{1}{x}+1\ \Rightarrow\ \mathbf{f'(1)=?}$

Yanıt / The Answer is **16**

19. $f(x)=\frac{1}{4}x^4-kx^2+2,\ f'(k)=k^2\ \Rightarrow\ \mathbf{k=?}$

Yanıt / The Answer is **3**

20. $f(x)=(x^2-4)\cdot(x^3+1)\ \Rightarrow\ \mathbf{f'(1)=?}$

Yanıt / The Answer is **−5**

21. $f(x)=(x^2-m)\cdot(x^3+2x),\ f'(0)=-4\ \Rightarrow\ \mathbf{m=?}$

Yanıt / The Answer is **2**

22. $f(x)=(x^2-1)\cdot g(x),$
$g(1)=2\ \Rightarrow\ \mathbf{f'(1)=?}$

Yanıt / The Answer is **4**

23. $f(x)=(x-1)\cdot(x-2)\cdot(x-3)\ \Rightarrow\ \mathbf{f'(0)=?}$

Yanıt / The Answer is **11**

24. $f(x)=\frac{x-1}{x+1}\ \Rightarrow\ \mathbf{f'(x)=?}$

Yanıt / The Answer is $\mathbf{\frac{2}{(x+1)^2}}$

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25. $f(x)=\dfrac{x^2-x+1}{x^2+3x-1} \Rightarrow f'(0)=?$

Yanıt / The Answer is -2

26. $f(x)=\dfrac{1}{x+1} \Rightarrow f'(1)=?$

Yanıt / The Answer is $-\dfrac{1}{4}$

27. $f(x)=\dfrac{g(x)}{1-x^3},\ g'(-1)=-1,\ g(-1)=1 \Rightarrow f'(-1)=?$

Yanıt / The Answer is $\dfrac{1}{4}$

28. $f(2x)=x^2 \Rightarrow f'(2)=?$

Yanıt / The Answer is 1

29. $f(3x)=3x^3+4 \Rightarrow f'(6)=?$

Yanıt / The Answer is 12

30. $f(x)=(x+2)^3 \Rightarrow f'(0)=?$

Yanıt / The Answer is 12

31. $f(x)=\sqrt{x^2+x} \Rightarrow f'(1)=?$

Yanıt / The Answer is $\dfrac{3\sqrt{2}}{4}$

32. $f(x)=\sqrt{x^2+4} \Rightarrow f'(2)=?$

Yanıt / The Answer is $\dfrac{1}{\sqrt{2}}$

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33. $f(x)=\sqrt[3]{x^2+2x} \Rightarrow f'(1)=?$

Yanıt / The Answer is $\dfrac{4}{3\cdot\sqrt[3]{9}}$

34. $f(x)=\dfrac{-3}{(x^2+x)^2} \Rightarrow f'(1)=?$

Yanıt / The Answer is $\dfrac{9}{4}$

35. $f(x)=|x+1| \Rightarrow f'(5)=?$

Yanıt / The Answer is 1

36. $f(x)=|x+1| \Rightarrow f'(-5)=?$

Yanıt / The Answer is –1

37. $f(x)=|x-3| \Rightarrow f'(3)=?$

Yanıt / The Answer is Türev yoktur./
The derivative does not exist.

38. $f(x)=|x^2| \Rightarrow f'(0)=?$

Yanıt / The Answer is 0

39. $f(x)=|x^3-2x^2-x+2| \Rightarrow f'(2)=?$

Yanıt / The Answer is Türev yoktur./
The derivative does not exist.

40. $f(x)=\sin x+\cos x \Rightarrow f'(x)=?$

Yanıt / The Answer is cosx–sinx

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41. $f(x) = x^4 - 4 \cdot \sin x \Rightarrow f'(x) = ?$

Yanıt / The Answer is $4x^3 - 4 \cdot \cos x$

42. $f(x) = x \cdot \sin x \Rightarrow f'(x) = ?$

Yanıt / The Answer is $\sin x + x \cdot \cos x$

43. $f(x) = \dfrac{\sin x}{x} \Rightarrow f'(x) = ?$

Yanıt / The Answer is $\dfrac{\cos x \cdot x - \sin x}{x^2}$

44. $f(x) = \dfrac{x^3}{\cos x} \Rightarrow f'(x) = ?$

Yanıt / The Answer is $\dfrac{3x^2 \cdot \cos x + \sin x \cdot x^3}{\cos^2 x}$

45. $f(x) = \sin(4x + 3) \Rightarrow f'(x) = ?$

Yanıt / The Answer is $4 \cdot \cos(4x + 3)$

46. $f(x) = \sin(\cos x) \Rightarrow f'(x) = ?$

Yanıt / The Answer is $-\sin x \cdot \cos(\cos x)$

47. $f(x) = \sin^2 3x \Rightarrow f'(x) = ?$

Yanıt / The Answer is $3 \cdot \sin 6x$

48. $\dfrac{d}{dx}(\sin x \cdot \cos x) = ?$

Yanıt / The Answer is $\cos 2x$

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49. $f(x) = \sin^2 2x - \cos^2 2x \Rightarrow f'(x) = ?$

Yanıt / The Answer is 4.sin4x

50. $f(x) = (1 + \sin 2x)^2 \Rightarrow f'(x) = ?$

Yanıt / The Answer is $4 \cdot \cos 2x \cdot (1 + \sin 2x)$

51. $f(x) = \tan 3x \Rightarrow f'(x) = ?$

Yanıt / The Answer is $3 \cdot \sec^2 3x$

52. $f(x) = \tan 5x \Rightarrow f'(x) = ?$

Yanıt / The Answer is $5 \cdot \sec^2 5x$

53. $f(x) = \cot x^3 \Rightarrow f'(x) = ?$

Yanıt / The Answer is $-3x^2 \cdot \operatorname{cosec}^2 x^3$

54. $f(x) = 3 \cdot \tan^2 3x \Rightarrow f'(x) = ?$

Yanıt / The Answer is $18 \cdot \tan 3x \cdot \sec^2 3x$

55. $f(x) = \sec x \Rightarrow f'(x) = ?$

Yanıt / The Answer is secx.tanx

56. $f(x) = \operatorname{cosec} x \Rightarrow f'\left(\frac{3\pi}{4}\right) = ?$

Yanıt / The Answer is $\sqrt{2}$

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57. $f(x) = 4 \cdot \tan x \Rightarrow f'\left(\frac{\pi}{3}\right) = ?$

Yanıt / The Answer is **16**

58. $f(x) = \tan^2 x - 1 \Rightarrow f'\left(\frac{\pi}{4}\right) = ?$

Yanıt / The Answer is **4**

59. $f(x) = \tan^3 4x \Rightarrow f'\left(\frac{\pi}{12}\right) = ?$

Yanıt / The Answer is **144**

60. $f(x) = \cos 2x - \sin 3x \Rightarrow f'\left(\frac{\pi}{6}\right) = ?$

Yanıt / The Answer is $-\sqrt{3}$

61. $\frac{d}{dx}(\sin(\cos 2x))\Big|_{x=\frac{\pi}{4}} = ?$

Yanıt / The Answer is **−2**

62. $f(x) = \arcsin 3x \Rightarrow f'(x) = ?$

Yanıt / The Answer is $\frac{3}{\sqrt{1-9x^2}}$

63. $f(x) = \arccos x^3 \Rightarrow f'(x) = ?$

Yanıt / The Answer is $\frac{-3x^2}{\sqrt{1-x^6}}$

64. $f(x) = \arctan(2x-6) \Rightarrow f'(x) = ?$

Yanıt / The Answer is $\frac{2}{1+(2x-6)^2}$

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65. $f(x)=\text{arccot}\,(x^2-1) \Rightarrow f'(x)=?$

Yanıt / The Answer is $\dfrac{-2x}{1+(x^2-1)^2}$

66. $f(x)=\arccos 2x \Rightarrow f'\left(\frac{1}{4}\right)=?$

Yanıt / The Answer is $-\dfrac{4\sqrt{3}}{3}$

67. $f(x)=2x^2\cdot \arctan x \Rightarrow f'(1)=?$

Yanıt / The Answer is $\pi+1$

68. $f(x)=\cos(\arctan x) \Rightarrow f'(\sqrt{3})=?$

Yanıt / The Answer is $-\dfrac{\sqrt{3}}{8}$

69. $f(x)=\arctan^2(x^3+1) \Rightarrow f'(0)=?$

Yanıt / The Answer is 0

70. $f(x)=\log_3(x^2+3x+3) \Rightarrow f'(x)=?$

Yanıt / The Answer is $\dfrac{2x+3}{x^2+3x+3}\cdot\dfrac{1}{\ln 3}$

71. $f(x)=2^{x^2+x} \Rightarrow f'(1)=?$

Yanıt / The Answer is $12\cdot\ln 2$

72. $f(x)=\log(\sin x) \Rightarrow f'\left(\frac{\pi}{4}\right)=?$

Yanıt / The Answer is $\dfrac{1}{\ln 10}$

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73. $f(x) = \ln x \Rightarrow f'(x) = ?$

Yanıt / The Answer is $\frac{1}{x}$

74. $f(x) = \ln(\sin x) \Rightarrow f'(x) = ?$

Yanıt / The Answer is $\cot x$

75. $f(x) = \ln(3x+2) \Rightarrow f'\left(\frac{1}{3}\right) = ?$

Yanıt / The Answer is 1

76. $f(x) = e^{-x} \Rightarrow f'(x) = ?$

Yanıt / The Answer is $-e^{-x}$

77. $f(x) = e^{4x+2} \Rightarrow f'(x) = ?$

Yanıt / The Answer is $4 \cdot e^{4x+2}$

78. $f(x) = 2e^{\sqrt{x}} \Rightarrow f'(x) = ?$

Yanıt / The Answer is $\frac{e^{\sqrt{x}}}{\sqrt{x}}$

79. $f(x) = e^{2\cdot \sin x - \cos x} \Rightarrow f'(x) = ?$

Yanıt / The Answer is $(2 \cdot \cos x + \sin x) \cdot e^{2\cdot \sin x - \cos x}$

80. $f(x) = \frac{e^x}{e^x+1} \Rightarrow f'(x) = ?$

Yanıt / The Answer is $\frac{e^x}{(e^x+1)^2}$

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81. $f(x)=\sin(-e^{2x}) \Rightarrow f'(x)=?$

Yanıt / The Answer is $-2\cdot e^{2x}\cdot\cos(-e^{2x})$

82. $f(x)=e^{e^x} \Rightarrow f'(x)=?$

Yanıt / The Answer is $e^x\cdot e^{e^x}$

83. $\left.\dfrac{d(e^{\sin x})}{dx}\right|_{x=\frac{5\pi}{6}}=?$

Yanıt / The Answer is $-\dfrac{\sqrt{3e}}{2}$

84. $f(x)=e^{\tan x} \Rightarrow f'\left(\frac{\pi}{4}\right)=?$

Yanıt / The Answer is $2\cdot e$

85. $e^{-x}\cdot\dfrac{d}{dx}\left(e^x\cdot(x^2+1)\right)=?$

Yanıt / The Answer is $(x+1)^2$

86. $f(x+1)=2e^x+2 \Rightarrow f'(0)=?$

Yanıt / The Answer is $\dfrac{2}{e}$

87. $f(x)=\ln(\sin x)+e^2 \Rightarrow f'(x)=?$

Yanıt / The Answer is $\cot x$

88. $f(x)=\log_2(x^2+1) \Rightarrow f'(1)=?$

Yanıt / The Answer is $\dfrac{1}{\ln 2}$

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89. $f(x)=e^{2x}\cdot\ln(x+1)\Rightarrow \mathbf{f'(0)=?}$

Yanıt / The Answer is **1**

90. $f(x)=\ln\left(\sin\left(\frac{\pi}{3}-x\right)\right)\Rightarrow \mathbf{f'(0)=?}$

Yanıt / The Answer is $-\frac{1}{\sqrt{3}}$

91. $f(x)=\ln(\ln(\sin x))\Rightarrow \mathbf{f'(x)=?}$

Yanıt / The Answer is $\frac{\cot x}{\ln(\sin x)}$

92. $f(x)=\ln(\sin x\cdot\cos^2 x)\Rightarrow \mathbf{f'\left(\frac{\pi}{4}\right)=?}$

Yanıt / The Answer is **−1**

93. $f:R^+\to R,$

$f(x)=3x^2-9\Rightarrow \mathbf{(f^{-1})'(18)=?}$

Yanıt / The Answer is $\frac{1}{18}$

94. $f:R^-\to R,$

$f(x)=x^2+4x+5\Rightarrow \mathbf{(f^{-1})'(5)=?}$

Yanıt / The Answer is $-\frac{1}{4}$

95. $f:R\to R,$

$f(x)=(x-2)^3\Rightarrow \mathbf{(f^{-1})'(8)=?}$

Yanıt / The Answer is $\frac{1}{12}$

96. $f:\left[\frac{5}{2},\infty\right)\to\left[-\frac{5}{4},\infty\right), f(x)=x^2-5x+5\Rightarrow \mathbf{(f^{-1})'(-1)=?}$

Yanıt / The Answer is **1**

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97. $f(x)=\sqrt{4-2x}-1 \Rightarrow (f^{-1})'(3)=?$

Yanıt / The Answer is -4

98. $f(x)=x^{10} \Rightarrow f^{(9)}(x)=?$

Yanıt / The Answer is $10!\cdot x$

99. $f(x)=(3x+2)^4 \Rightarrow \dfrac{d^4y}{dx^4}=?$

Yanıt / The Answer is $4!\cdot 3^4$

100. $f(x)=e^{2x} \Rightarrow \dfrac{d^8y}{dx^8}=?$

Yanıt / The Answer is $2^8\cdot e^{2x}$

101. $f(x)=\cos 2x \Rightarrow f^{(10)}(x)=?$

Yanıt / The Answer is $-2^{10}\cdot\cos 2x$

102. $f(x)=\sin x \Rightarrow f^{(238)}(x)=?$

Yanıt / The Answer is $-\sin x$

103. $f(x)=e^{3x}+(3x-2)^9 \Rightarrow f^{(10)}(x)=?$

Yanıt / The Answer is $3^{10}\cdot e^{3x}$

104. $y=\cos x+\sin x \Rightarrow \dfrac{d^{10}y}{dx^{10}}=?$

Yanıt / The Answer is $-\cos x-\sin x$

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105. $y=ax^3+bx^2,\ \dfrac{d^2y}{dx^2}=6x+2 \Rightarrow \mathbf{a+b=?}$

Yanıt / The Answer is 2

106. $f(x)=ax^3+bx^2-3x-4,$
$f'(1)=3$ ve (and) $f'(-1)=-3$
$\Rightarrow \mathbf{a+b=?}$

Yanıt / The Answer is $\frac{5}{2}$

107. $y=x^{39}+39x \Rightarrow \dfrac{d^{39}y}{dx^{39}}=?$

Yanıt / The Answer is 39!

108. $y=x^{65}+65x+127 \Rightarrow \dfrac{d^{66}y}{dx^{66}}=?$

Yanıt / The Answer is 0

109. $\left.\begin{array}{l} y=t^2+3t \\ t=x^2-1 \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{x=1}=?$

Yanıt / The Answer is 6

110. $\left.\begin{array}{l} y=t^3-3t^2+2 \\ t=3x^2-x \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{x=\frac{1}{6}}$

Yanıt / The Answer is 0

111. $\left.\begin{array}{l} y=t^2-2t \\ t=2x-1 \\ x=4u^2 \end{array}\right\} \Rightarrow \left.\dfrac{dy}{du}\right|_{u=1}=?$

Yanıt / The Answer is 192

112. $\left.\begin{array}{l} y=3t^2-3t \\ x=2t+1 \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{t=0}=?$

Yanıt / The Answer is $-\frac{3}{2}$

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113. $\left.\begin{array}{l} y = 2u^2 + 3 \\ x = u^3 + 3 \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{u=2} = ?$

Yanıt / The Answer is $\dfrac{2}{3}$

114. $\left.\begin{array}{l} y = t^2 - 5t + 1 \\ x = 2t + 1 \end{array}\right\} \Rightarrow \left.\dfrac{d^2y}{dx^2}\right|_{t=-1} = ?$

Yanıt / The Answer is $\dfrac{1}{2}$

115. $\left.\begin{array}{l} y = 3 \cdot \cos t \\ x = 2 \cdot \sin t \end{array}\right\} \Rightarrow \dfrac{d^2y}{dx^2} = ?$

Yanıt / The Answer is $\dfrac{-3}{4 \cdot \cos^3 t}$

116. $f(x,y) = xy^2 - x^2y \Rightarrow f'(x,y) = ?$

Yanıt / The Answer is $-\dfrac{y^2 - 2xy}{2xy - x^2}$

117. $x^2 - 2xy + y^2 + 4x - 5 = 0 \Rightarrow \left.\dfrac{dy}{dx}\right|_{(1,0)} = ?$

Yanıt / The Answer is 3

118. $f(x,y) = \sin x + \cos y + xy = 0 \Rightarrow \dfrac{dy}{dx} = ?$

Yanıt / The Answer is $\dfrac{\cos x + y}{\sin y - x}$

119. $f(x,y) = x^2y^3 - 3xy + 2yx^2 = 0 \Rightarrow \left.\dfrac{dy}{dx}\right|_{(1,1)} = ?$

Yanıt / The Answer is $-\dfrac{3}{2}$

120. $f(x) = x^x \Rightarrow f'(x) = ?$

Yanıt / The Answer is $x^x(\ln x + 1)$

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121. $f(x)=(\cos x)^{x} \Rightarrow f'(0)=?$

Yanıt / The Answer is **0**

122. $f(x)=(\sin x)^{\ln x} \Rightarrow f'\left(\frac{\pi}{2}\right)=?$

Yanıt / The Answer is **0**

123. $f(x)=\operatorname{sgn}(x^2-x-2) \Rightarrow f'(-1)=?$

Yanıt / The Answer is **Türev yoktur./ The derivative does not exist.**

124. $f(x)=\operatorname{sgn}(x^2-x-2) \Rightarrow f'(2)=?$

Yanıt / The Answer is **Türev yoktur./ The derivative does not exist.**

125. $f(x)=\operatorname{sgn}(x^2-x-2) \Rightarrow f'(1)=?$

Yanıt / The Answer is **0**

126. $f(x)=\operatorname{sgn}(x^2+6x+8) \Rightarrow f'(4)=?$

Yanıt / The Answer is **0**

127. $f(x)=[|x+1|] \Rightarrow f'(1)=?$

Yanıt / The Answer is **Türev yoktur./ The derivative does not exist.**

128. $f(x)=[|x+1|] \Rightarrow f'\left(\frac{1}{3}\right)=?$

Yanıt / The Answer is **0**

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1. $f(x) = x^2 + 3x + 2$

$\Rightarrow \lim\limits_{x \to 4} \dfrac{f(x) - f(4)}{x - 4} = ?$

A) 4 B) 5 C) 8 D) 9 E) 11

2. $f(x) = x^2 - 2x - 3$

$\Rightarrow \lim\limits_{h \to 0} \dfrac{f(x+h) - f(x-2h)}{h} = ?$

A) $2x - 2$ B) $2x - 3$ C) $6x - 2$ D) $6x - 3$ E) $6x - 6$

3. $f(x) = x^2 + 2x$,

$\Rightarrow \lim\limits_{x \to 3} \dfrac{f(x) - f(3)}{x - 3} = ?$

A) 8 B) 10 C) 12 D) 15 E) 18

4. $f(x) = x^2 - 4x + 5$

$\Rightarrow \lim\limits_{x \to 2} \dfrac{f(x) - f(2)}{x - 2} = ?$

A) –2 B) –1 C) 0 D) 2 E) 4

5. $f(x) = 3x^2 - 2x + 1$

$\Rightarrow \lim\limits_{h \to 0} \dfrac{f(1+h) - f(1)}{h} = ?$

A) 2 B) 4 C) 6 D) 8 E) 10

6. $f(x) = x^3 + mx^2 - 4x + 3$

$\lim\limits_{x \to 3} \dfrac{f(x) - f(3)}{x - 3} = -1 \Rightarrow m = ?$

A) –4 B) –3 C) –2 D) 3 E) 4

7. $f(x) = \sin x + \cos x$

$\Rightarrow \lim\limits_{x \to \frac{\pi}{2}} \dfrac{f(x) - f\left(\frac{\pi}{2}\right)}{x - \frac{\pi}{2}} = ?$

A) $-\sqrt{2}$ B) $-\dfrac{\sqrt{2}}{2}$ C) –1 D) $\dfrac{\sqrt{2}}{2}$ E) $\sqrt{2}$

8. $f(x) = \begin{cases} x^3 - 3x, & x \le 2 \\ 9x + 8, & 2 < x \end{cases}$

$\Rightarrow f'(2) = ?$

A) 2 B) 4 C) 6 D) 9 E) Türev yoktur. / The derivative does not exist.

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9. $f(x) = x^3 - 4x + 7$

$\Rightarrow$ **$f'(1) = ?$**

A) –2 B) –1 C) 1 D) 2 E) 6

10. $f(x) = 4x^3 - 3x^2 + 5$

$\Rightarrow$ **$f'(-1) = ?$**

A) 12 B) 14 C) 16 D) 18 E) 20

11. $f(x) = x^3 + ax^2 - 3x + 1,$

$f'(x) = bx^2 + 4x + c,$

$\Rightarrow$ **$a + b + c = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $f(x) = ax^3 - 3x^2 + 2x - 1,$

$f'(1) = 8 \Rightarrow$ **$a = ?$**

A) 2 B) 4 C) 6 D) 8 E) 10

13. $f(x) = ax^3 + 3x^2 + b$

$f'(2) = 16 \Rightarrow$ **$a = ?$**

A) $\frac{1}{9}$ B) $\frac{1}{3}$ C) 1 D) 3 E) 9

14. $f(x) = x^3 - 4x^2 + (a-1)x + 4$

$f'(2) = f(2) \Rightarrow$ **$a = ?$**

A) 5 B) 4 C) 3 D) 2 E) 1

15. $f(x) - f'(x) = 4x^2 + 6x + 7$

$\Rightarrow$ **$f'(-2) = ?$**

A) –6 B) –4 C) –2 D) –1 E) 0

16. $f(x) - f'(x) = 6x^3 + 3x^2 - 9x + 12$

$\Rightarrow$ **$f(0) = ?$**

A) 40 B) 45 C) 50 D) 55 E) 60

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	E	A	C	B	A	C	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	D	B	B	B	E	C	B

1. $f(x) = 3x^3 - 2x + 5$

$\Rightarrow \lim\limits_{x \to 2} \dfrac{f(x) - f(2)}{x - 2} = ?$

A) 30 B) 34 C) 38 D) 42 E) 46

2. $f(x) = 4x^5 - 7x^3 + 6x^2 - 5x + 2$

$\Rightarrow \lim\limits_{x \to 1} \dfrac{f(x) - f(1)}{x - 1} = ?$

A) 3 B) 6 C) 12 D) 15 E) 16

3. $f(x) = x \cdot \sin x \Rightarrow \lim\limits_{x \to \pi} \dfrac{f(x) - f(\pi)}{x - \pi} = ?$

A) π B) $\dfrac{\pi}{2}$ C) $-\dfrac{\pi}{2}$ D) $-\pi$ E) -2π

4. $f: R \to R$,

$f(4 - 3x) = x^3 + 6x^2 - 9x + 12$

$\Rightarrow \lim\limits_{x \to -2} \dfrac{f(x) - f(-2)}{x + 2} = ?$

A) –81 B) –72 C) –54 D) –36 E) – 9

5. $f(x) = x^4 - 6x^2 + (a + 2)x - 7$,

$\lim\limits_{x \to 3} \dfrac{f(x) - f(3)}{x - 3} = 82 \Rightarrow a = ?$

A) 3 B) 4 C) 5 D) 7 E) 8

6. $f(x) = x^2 - 2x + 3$

$\Rightarrow \lim\limits_{h \to 0} \dfrac{f(x + h) - f(x)}{h} = ?$

A) x B) $2x$ C) $x - 2$ D) $2x - 2$ E) $2x + 2$

7. $f(x) = x^3 + 3x^2 - 6x + 8$

$x = 2 \Rightarrow \lim\limits_{h \to 0} \dfrac{f(x + h) - f(x)}{h} = ?$

A) 18 B) 11 C) 9 D) 7 E) 5

8. $f(x) = x^2 + 2x + 4$

$\Rightarrow \lim\limits_{h \to 0} \dfrac{f(2h + 1) - f(1)}{h} = ?$

A) 8 B) 4 C) 2 D) 16 E) 32

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9. $f(x) = x^2 + 1$

$\Rightarrow \lim_{h \to 0} \frac{f(x+h)-f(x)}{h} = ?$

A) x B) 2x C) 3x D) 4x E) 5x

10. $f(x) = x^3 + 4x^2 - 8x + 7$

$\Rightarrow \lim_{h \to 0} \frac{f(2+h)-f(2)}{h} = ?$

A) 5 B) 10 C) 15 D) 20 E) 25

11. $f: R - \{2\} \to R - \{1/3\}$,

$f(x) = \frac{x}{3x-6} \Rightarrow \lim_{h \to 0} \frac{f(3+h)-f(3)}{h} = ?$

A) $-\frac{1}{3}$ B) $-\frac{2}{3}$ C) -1 D) -2 E) $-\frac{5}{3}$

12. $f(x) = x^3 - 4x - 8$,

$x = 3 \Rightarrow \lim_{h \to 0} \frac{f(x-h)-f(x+h)}{h} = ?$

A) –42 B) –43 C) –44 D) –45 E) –46

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13. $f(x) = x^4 - 4x^3 + x^2 - 2x + 1$,

$x = 2 \Rightarrow \lim_{h \to 0} \frac{f(x+2h)-f(x)}{2h} = ?$

A) –1 B) –7 C) –14 D) –28 E) –35

14. $f(x) = x^3 + 2x^2 + 12x + 8$

$\Rightarrow \lim_{h \to 0} \frac{f(2+5h)-f(2-3h)}{64h} = ?$

A) 2^2 B) 2^3 C) 2^4 D) 2^5 E) 2^6

YANITLAR / ANSWERS

1	2	3	4	5	6	7
B	B	D	E	E	D	A
8	**9**	**10**	**11**	**12**	**13**	**14**
A	B	D	B	E	C	A

1. $f(x)=x^4-12x^2+2 \Rightarrow f'(2)=?$

A) -2^2 B) -2^3 C) -2^4 D) -2^5 E) -2^6

2. $f(x)=\frac{(x^2+3x)^3}{3}+3 \Rightarrow f'(1)=?$

A) 70 B) 75 C) 80 D) 85 E) 90

3. $f(x)=\frac{2}{x}+\frac{3}{x^2}-\frac{4}{2x-3} \Rightarrow f'(1)=?$

A) –2 B) –1 C) 0 D) 1 E) 2

4. $f(x)=\frac{3}{x}+\frac{1}{x^2}+\frac{2}{2x+3} \Rightarrow f'(-1)=?$

A) –5 B) –3 C) 0 D) 3 E) 5

5. $f(x)=x^3+\frac{2}{x^2}+\sqrt[3]{x^2} \Rightarrow f'(1)=?$

A) –1 B) $-\frac{2}{3}$ C) $-\frac{1}{3}$ D) 1 E) $\frac{3}{2}$

6. $f(x)=\sqrt[3]{x^2}+3x^{-2}-x+3 \Rightarrow f'(1)=?$

A) $-\frac{22}{3}$ B) $-\frac{20}{3}$ C) $-\frac{19}{3}$ D) $-\frac{17}{3}$ E) $-\frac{16}{3}$

7. $f(x) = (2x + 5)^3 \Rightarrow f'(-3) = ?$

A) –6 B) –3 C) –1 D) 3 E) 6

8. $f(x) = (x^2 - 5x + 7)^3 \Rightarrow f'(2) = ?$

A) –7 B) –5 C) –3 D) 3 E) 5

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9. $f(x) = (x^3 - 3x^2 + 5)^4$

$\Rightarrow$ **f′(−1) = ?**

A) −36 B) −18 C) −12 D) 12 E) 36

10. $f(x) = (3x^2 - 2x)\cdot(x^3 - x + 1)$

$\Rightarrow$ **f′(2) = ?**

A) 148 B) 158 C) 162 D) 168 E) 176

11. $f(x) = (x^2 + 3x - 2)\cdot(2x^2 - x - 3)$

$\Rightarrow$ **f′(1) = ?**

A) −16 B) −12 C) −8 D) −4 E) − 1

12. $f(x) = (x^2 + 1)\cdot(2 + x)^3$

$\Rightarrow$ **f′(0) = ?**

A) 3 B) 6 C) 9 D) 12 E) 15

13. $f(x) = (x^2 - x - 1)\cdot(x^4 + 1)^2$ $\Rightarrow$ **f′(0) = ?**

A) −3 B) −1 C) 0 D) 1 E) 3

14. $f(x) = \sqrt{x^2 - 5x + 16}$ $\Rightarrow$ **f′(5) = ?**

A) $\frac{3}{4}$ B) $\frac{5}{6}$ C) $\frac{5}{8}$ D) $\frac{7}{8}$ E) $\frac{5}{4}$

15. $f(x) = x^3 \cdot \sqrt{x^3 + 3}$ $\Rightarrow$ **f′(1) = ?**

A) $\frac{15}{2}$ B) $\frac{17}{2}$ C) $\frac{21}{4}$ D) $\frac{27}{4}$ E) $\frac{31}{4}$

16. $f(x) = \frac{2x}{x^2 + 1}$ $\Rightarrow$ **f′(3) = ?**

A) $\frac{3}{5}$ B) $\frac{4}{5}$ C) $-\frac{1}{25}$ D) $\frac{2}{25}$ E) $-\frac{4}{25}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	C	C	A	C	C	E	C
9	10	11	12	13	14	15	16
E	B	D	D	B	C	D	E

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1. $a \in R^+$,

$f(x)=\frac{x-2}{x+3}$, $f'(a)=\frac{1}{5}$ ⇒ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

2. $f(x)=\frac{x^2+2x-9}{x+2}$ ⇒ **f'(−1) = ?**

A)5 B) 10 C) 15 D) 20 E) 25

3. $f(x)=\frac{6x^2+4x+7}{2x+8}$ ⇒ **f'(1) = ?**

A) 1,23 B) 1,26 C) 1,29 D) 1,32 E) 1,35

4. $f(x)=\frac{4x-1}{x^2-5}$ ⇒ **f'(2) = ?**

A) −32 B) −28 C) −24 D) 24 E) 28

5. $f(x)=\frac{-1}{x^3+2x^2+8}$ ⇒ **f'(−1) = ?**

A) $-\frac{1}{81}$ B) $-\frac{1}{72}$ C) $-\frac{1}{54}$ D) $-\frac{1}{27}$ E) $-\frac{1}{9}$

6. $f(x) = 3\cdot(x^2-2x)^4$ ⇒ **f'(1) = ?**

A) −12 B) −6 C) 0 D) 6 E) 12

7. $f(x)=\sqrt[3]{x^2+5x+2}$ ⇒ **f'(1) = ?**

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{4}{3}$ D) $\frac{5}{12}$ E) $\frac{7}{12}$

8. $f(x)=\sqrt[3]{x^2+4}$ ⇒ **f'(2) = ?**

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

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9. $f(3x+2) = x^3 + 2x^2 - 3x + 5 \Rightarrow$ **$f'(-4) = ?$**

A) $-\frac{2}{3}$ B) $-\frac{1}{3}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) 1

10. $f(2x+3) = 3x^2 + 4x + 1 \Rightarrow$ **$f'(5) = ?$**

A) 1 B) 3 C) 5 D) 7 E) 9

11. $f(2x-6) = x^3 - 2x^2 + 3x - 4 \Rightarrow$ **$f'(4) = ?$**

A) 23 B) 25 C) 27 D) 29 E) 32

12. $f(x^3 - 2x) = 3x^2 - 4x - 5 \Rightarrow$ **$f'(-4) = ?$**

A) $-\frac{12}{5}$ B) $-\frac{8}{5}$ C) $-\frac{7}{10}$ D) $\frac{8}{5}$ E) $\frac{7}{10}$

13. $x \in Z$,

$f(2x^2 - 3x) = x^4 + x^2 \Rightarrow$ **$f'(-1) = ?$**

A) 2 B) 4 C) 6 D) 8 E) 10

14. $x \neq 0$,

$f(x^3 - 2x^2) = 3x^2 - 4x + 7 \Rightarrow$ **$f'(0) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 6

15. $(x^2 + 2)\cdot g(x) = f(3x - 1)$,

$g(2) = 3,\ f'(5) = 1 \Rightarrow$ **$g'(2) = ?$**

A) $-\frac{7}{2}$ B) $-\frac{5}{2}$ C) $-\frac{3}{2}$ D) $\frac{3}{2}$ E) $\frac{5}{2}$

16. $\left.\begin{array}{l} f(x) = x^2 + 1 \\ g(x) = x^2 + 2x \end{array}\right\} \Rightarrow$ **$(gof)'(1) = ?$**

A) 12 B) 10 C) 7 D) 6 E) 8

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1	2	3	4	5	6	7	8
B	B	B	A	A	C	E	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	C	D	B	C	B	C	A

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1. $g(2) = 3,\ f'(3) = 6,\ g'(2) = 4 \Rightarrow$ **$(fog)'(2) = ?$**

A) 18 B) 20 C) 22 D) 24 E) 26

2. $f(x) = x^3 - 2x^2 + 1,$

$g(x) = x^2 + 3x + 2 \Rightarrow$ **$(fog)'(-2) = ?$**

A) –2 B) –1 C) 0 D) 1 E) 2

3. $f(x) = -2x^2 + 2x + 3$

$g(x) = x - 3$

$\Rightarrow$ **$(fog)'(3) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $f(x) = x^3 + 3x$

$g(x) = x^2 - 1$

$\Rightarrow$ **$(gof)'(-1) = ?$**

A) –40 B) –48 C) –56 D) –64 E) –72

5. $f(x) = 2x - 1,$

$(gof)(x) = -5x^2 + 4x \Rightarrow$ **$g'(3) = ?$**

A) –18 B) –8 C) –3 D) 3 E) 13

6. $f(x) = 3x^2 + 2x,$

$g(x) = 2x + 4$

$\Rightarrow$ **$(fog)'(1) = ?$**

A) 72 B) 76 C) 80 D) 84 E) 88

7. $f(x) = x^3 - 4 \Rightarrow$ **$(f^{-1})'(4) = ?$**

A) $\frac{1}{12}$ B) $\frac{1}{6}$ C) $\frac{2}{5}$ D) $\frac{5}{12}$ E) $\frac{5}{6}$

8. $f(x) = x^3 + 15 \Rightarrow$ **$(f^{-1})'(-12) = ?$**

A) $-\frac{1}{27}$ B) $-\frac{1}{9}$ C) $\frac{1}{9}$ D) $\frac{1}{27}$ E) $\frac{1}{36}$

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9. $x \in R^+$,
$f(x) = x^2 + 4x - 3 \Rightarrow (f^{-1})'(2) = ?$

A) $\frac{1}{12}$ B) $\frac{1}{16}$ C) $\frac{1}{3}$ D) $\frac{1}{2}$ E) $\frac{5}{12}$

10. $x \in R^-$,
$f(x) = x^2 - 2x - 6 \Rightarrow (f^{-1})'(2) = ?$

A) $-\frac{1}{6}$ B) $-\frac{1}{4}$ C) $-\frac{1}{2}$ D) $\frac{1}{2}$ E) $\frac{1}{4}$

11. $x \in R^-$,
$f(x) = x^2 + 3x - 6 \Rightarrow (f^{-1})'(4) = ?$

A) $-\frac{1}{7}$ B) $-\frac{1}{5}$ C) $-\frac{1}{3}$ D) $\frac{1}{7}$ E) $\frac{1}{5}$

12. $f(x) = \frac{2x-5}{x+1} \Rightarrow (f^{-1})'(3) = ?$

A) -7 B) $-\frac{1}{7}$ C) 0 D) $\frac{1}{7}$ E) 7

13. $f(x) = \frac{-3x+4}{2x-1} \Rightarrow (f^{-1})'(-2) = ?$

A) -7 B) -6 C) -5 D) $-\frac{1}{5}$ E) $-\frac{1}{6}$

14. $f(x) = \frac{2x-5}{x+3} \Rightarrow (f^{-1})'(3) = ?$

A) 8 B) 10 C) 11 D) 13 E) 15

15. $f : [1, +\infty) \rightarrow [-7, +\infty)$,
$f(x) = x^2 - 2x - 6 \Rightarrow (f^{-1})'(2) = ?$

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

16. $f: \left[\frac{1}{2}, \infty\right) \rightarrow R$
$f(x) = x^2 - x - 4 \Rightarrow (f^{-1})'(2) = ?$

A) $-\frac{1}{2}$ B) $-\frac{1}{3}$ C) $-\frac{1}{5}$ D) $\frac{1}{5}$ E) $\frac{1}{2}$

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1	2	3	4	5	6	7	8
D	C	B	B	B	B	A	D
9	10	11	12	13	14	15	16
B	A	A	E	C	C	A	D

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1. $f(x) = |x^2 - 3| \Rightarrow f'(-1) = ?$

A) –3 B) –2 C) –1 D) 2 E) 3

2. $f(x) = |x^2 + 2x - 7| \Rightarrow f'(2) = ?$

A) 2 B) 4 C) 6 D) 8 E) 0

3. $f(x) = |x^3 - 8| \Rightarrow f'(-2) = ?$

A) –96 B) –72 C) –48 D) –24 E) –12

4. $f(x) = |x^3 + 7| + 3x^2 - 5 \Rightarrow f'(-2) = ?$

A) –24 B) –18 C) 0 D) 12 E) 24

5. $f: R \to R$

$f(x) = |x^3 - 4x^2| + x + 2 \Rightarrow f'(6) = ?$

A) 59 B) 61 C) 63 D) 65 E) 67

6. $F(x, y) = x^2 - xy + y - 4 = 0 \Rightarrow \frac{dy}{dx}(x = 3) = ?$

A) $-\frac{7}{4}$ B) $-\frac{7}{2}$ C) 0 D) $\frac{7}{4}$ E) $\frac{7}{2}$

7. $F(x, y) = x^3 - 2x^2y - 3y - 4x - 6 = 0 \Rightarrow \frac{dy}{dx}(x = 0) = ?$

A) $-\frac{4}{3}$ B) $-\frac{2}{3}$ C) $-\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{4}{3}$

8. $4x^2 - 3xy - 5x + 6y - 8 = 0 \Rightarrow \frac{dy}{dx}(x = 1) = ?$

A) –3 B) –2 C) 1 D) 2 E) 3

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9. $2x^3 - 3y^3 + 4x^2 + 5y - x + 6 = 0 \quad \Rightarrow \quad \mathbf{f'(-1, 1) = ?}$

A) $-\frac{3}{4}$ B) $-\frac{2}{3}$ C) $-\frac{1}{2}$ D) $\frac{2}{3}$ E) $\frac{3}{4}$

10. $x^2y + 3xy^3 - 4x + 5y - 6 = 0 \;\Rightarrow\; \mathbf{f'(2, -1) = ?}$

A) $-\frac{11}{27}$ B) $-\frac{11}{6}$ C) $-\frac{5}{6}$ D) $\frac{11}{27}$ E) $\frac{11}{6}$

11. $f(x, y) = x^3 + 2xy + y^2 - 5 = 0 \;\Rightarrow\; \mathbf{f'(1, 2) = ?}$

A) $-\frac{11}{6}$ B) $-\frac{7}{6}$ C) $\frac{7}{6}$ D) $\frac{11}{4}$ E) $\frac{13}{4}$

12. $f(x, y) = x^3 - 3x^2y + 2xy^2 + y^3 - 4 = 0 \;\Rightarrow\; \mathbf{f'(-1, 1) = ?}$

A) $-\frac{11}{4}$ B) $-\frac{7}{4}$ C) $\frac{7}{4}$ D) $\frac{11}{4}$ E) $\frac{13}{4}$

13. $f(x, y) = x^3 - 4y^2 + 5x^2 + 3y^3 - y - 6 = 0$

$\Rightarrow \mathbf{f'(-2, -1) = ?}$

A) $\frac{1}{8}$ B) $\frac{1}{6}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

14. $F(x, y) = 4x^2 - 3xy + 2x + 4y - 5 = 0$

$\Rightarrow \mathbf{\frac{dy}{dx}(x = 1) = ?}$

A) −11 B) −12 C) −13 D) −14 E) −15

15. $\sin^2 x + \cos y + \frac{\pi}{3} = 0$

$\Rightarrow \mathbf{f'\left(\frac{\pi}{6}, \frac{\pi}{3}\right) = ?}$

A) $-\sqrt{3}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) 1 E) $\sqrt{3}$

16. $x \cdot \sin x - \ln y + 3x = 0$

$\Rightarrow \mathbf{\frac{dy}{dx}(x = 0) = ?}$

A) 0 B) 1 C) −2 D) 3 E) −4

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1	2	3	4	5	6	7	8
D	C	E	A	B	D	A	D
9	10	11	12	13	14	15	16
A	D	B	D	D	C	D	D

1. $\left.\begin{aligned} y &= u^2 + 3u - 7 \\ u &= 2x + 1 \end{aligned}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{x=0} = ?$

A) 5 B) 10 C) 15 D) 20 E) 25

2. $\left.\begin{aligned} y &= 2e^t \\ x &= 3e^{-t} \end{aligned}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{t=0} = ?$

A) $\frac{1}{3}$ B) $-\frac{2}{3}$ C) -1 D) -2 E) -4

3. $\left.\begin{aligned} y &= t + 3 \\ t &= 2z - 1 \\ z &= x^2 + 2x \end{aligned}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{x=3} = ?$

A) 20 B) 16 C) 14 D) 12 E) 8

4. $\left.\begin{aligned} y &= t^2 + 2t + 1 \\ t &= 2z - 3 \\ z &= x + 1 \end{aligned}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{x=-2} = ?$

A) –20 B) –16 C) –12 D) –8 E) –4

5. $\left.\begin{aligned} x &= t^2 - 3t + 5 \\ y &= 3t^3 - 4t \end{aligned}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{t=-1} = ?$

A) –2 B) –1 C) 1 D) 2 E) 3

6. $\left.\begin{aligned} x &= 5 \cdot \sec t \\ y &= 4 \cdot \tan t \end{aligned}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{t=\frac{\pi}{3}} = ?$

A) $8\sqrt{3}$ B) $\sqrt{3}$ C) $\frac{8\sqrt{3}}{5}$ D) $\frac{8\sqrt{3}}{3}$ E) $\frac{8\sqrt{3}}{15}$

7. $\left.\begin{aligned} y &= 2t^2 - 5t + 3 \\ t &= z^2 + 3z \\ z &= x - 3 \end{aligned}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{x=2} = ?$

A) –13 B) –7 C) –2 D) 2 E) 7

8. $\left.\begin{aligned} y &= u^3 + 3u \\ u &= t^2 - 2t + 1 \\ t &= x - 3 \end{aligned}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{x=2} = ?$

A) –204 B) –200 C) –196 D) –192 E) –188

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9. $\left.\begin{array}{l} x = u^3 - 4u^2 + 5 \\ y = 3u^2 + 2u - 4 \end{array}\right\} \Rightarrow \dfrac{dy}{dx}(u = 2) = ?$

A) $-\frac{9}{2}$ B) $-\frac{7}{2}$ C) $-\frac{5}{2}$ D) $\frac{7}{2}$ E) $\frac{9}{2}$

10. $\left.\begin{array}{l} x = 2\cos 3t \\ y = \sin 2t \end{array}\right\} \Rightarrow \dfrac{dy}{dx}\left(t = \frac{\pi}{6}\right) = ?$

A) $-\frac{1}{6}$ B) $-\frac{1}{3}$ C) $-\frac{1}{2}$ D) $-\frac{\sqrt{2}}{2}$ E) $-\frac{\sqrt{3}}{2}$

11. $\left.\begin{array}{l} x = 2t - 3 \\ y = t^2 - 2t + 1 \end{array}\right\} \Rightarrow \dfrac{d^2y}{dx^2} = ?$

A) $-\frac{1}{2}$ B) 0 C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

12. $\left.\begin{array}{l} x = t^2 - 2t \\ y = t^3 - 8t + 1 \end{array}\right\} \Rightarrow \left.\dfrac{d^2y}{dx^2}\right|_{t=2} = ?$

A) $-\frac{1}{2}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 4

13. $\left.\begin{array}{l} x = t^2 - 3t - 3 \\ y = 2t + 1 \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{\substack{x=1 \\ y=9}} = ?$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

14. $\left.\begin{array}{l} x = 2 \cdot \sin 3t \\ y = \cos 2t \end{array}\right\} \Rightarrow \left.\dfrac{dy}{dx}\right|_{t=\pi/4} = ?$

A) $\frac{\sqrt{3}}{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{\sqrt{2}}{3}$ D) $\frac{\sqrt{2}}{4}$ E) $\frac{\sqrt{2}}{6}$

15. $\left.\begin{array}{l} x = t^3 - t^2 \\ y = 3t^2 + 4 \end{array}\right\} \Rightarrow \left.\dfrac{d^2y}{dx^2}\right|_{t=1} = ?$

A) –36 B) –24 C) –18 D) 18 E) 24

16. $\left.\begin{array}{l} x = 2 + \cos t \\ y = 3 - \sin t \end{array}\right\} \Rightarrow \left.\dfrac{d^2y}{dx^2}\right|_{t=\frac{\pi}{4}} = ?$

A) $-2\sqrt{2}$ B) $-\sqrt{2}$ C) $\sqrt{2}$ D) $2\sqrt{2}$ E) $3\sqrt{2}$

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1	2	3	4	5	6	7	8
B	B	B	B	B	E	A	A
9	10	11	12	13	14	15	16
B	A	D	D	B	C	C	D

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1. $f(x) = \sin 4x + \cos 3x \Rightarrow \mathbf{f'(0) = ?}$

A) –4 B) –2 C) 0 D) 2 E) 4

2. $f(x) = \cos x + 3\cdot\sin x \Rightarrow \mathbf{f'\left(\frac{\pi}{6}\right) = ?}$

A) $\frac{-1-3\sqrt{3}}{2}$ B) $\frac{1-3\sqrt{3}}{2}$ C) $\frac{-1+3\sqrt{3}}{2}$ D) $1 + 3\sqrt{3}$ E) $-1 + 3\sqrt{3}$

3. $f(x) = \sin^3 x \Rightarrow \mathbf{f'(x) = ?}$

A) $3\cdot\sin x\cdot\cos x$
B) $3\cdot\sin^2 x\cdot\cos x$
C) $3\cdot\cos^2 x$
D) $3\cdot\sin^2 x$
E) $3\cdot\sin x\cdot\cos^2 x$

4. $f(x) = \sin x^4 \Rightarrow \mathbf{f'(x) = ?}$

A) $4x^3 \cdot \cos x^4$
B) $x^4 \cdot \cos x^4$
C) $4x^3 \cdot \sin x^4$
D) $x^4 \cdot \sin x^4$
E) $3x^3 \cdot \cos x^4$

5. $f(x) = \sin 4x \cdot \cos 2x \Rightarrow \mathbf{f'\left(\frac{\pi}{12}\right) = ?}$

A) $-\frac{3\sqrt{3}}{2}$ B) $-\frac{\sqrt{3}}{2}$ C) 0 D) $\frac{\sqrt{3}}{2}$ E) $\frac{3\sqrt{3}}{2}$

6. $f(x) = \sin^2 x\cdot\cos^3 x \Rightarrow \mathbf{f'\left(\frac{\pi}{2}\right) = ?}$

A) –3 B) –1 C) 0 D) 1 E) 3

7. $f(x) = \sin(\ln x) \Rightarrow \mathbf{f'(x) = ?}$

A) $x\cdot\cos(\ln x)$
B) $x\cdot\sin(\ln x)$
C) $\frac{1}{x}\cdot\cos(\ln x)$
D) $\frac{1}{x}\cdot\sin(\ln x)$
E) $\cos x\cdot\frac{1}{x}$

8. $f(x) = 2\cdot\tan x \Rightarrow \mathbf{f'\left(\frac{\pi}{3}\right) = ?}$

A) –12 B) 8 C) 12 D) $-3\sqrt{2}$ E) $6\sqrt{2}$

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9. $f(x)=\tan 2x-\cot 2x \Rightarrow f'\left(\frac{\pi}{8}\right)=?$

A) 2 B) 4 C) 6 D) 8 E) 10

10. $f(x)=\tan x\cdot(1+\cot x) \Rightarrow f'\left(\frac{\pi}{4}\right)=?$

A) 0 B) 1 C) 2 D) 3 E) 4

11. $f(x)=\frac{\tan x}{\sin 2x} \Rightarrow f'\left(\frac{\pi}{4}\right)=?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 4

12. $f(x)=\cos e^x \Rightarrow f'(x)=?$

A) $-e^x\cdot \sin e^x$ B) $-e^x\cdot \cos e^x$

C) $-e^x\cdot \sin e^x\cdot \cos x$ D) $e^x\cdot \sin e^x$

E) $e^x\cdot \cos e^x$

13. $f(x)=\sin\frac{\pi}{6}+\tan x+\cos\frac{\pi}{4} \Rightarrow f'\left(\frac{\pi}{4}\right)=?$

A) –2 B) –1 C) 0 D) 1 E) 2

14. $f(x)=e^x\cdot \sin x \Rightarrow f'\left(\frac{\pi}{2}\right)=?$

A) $\frac{\pi}{2}$ B) $\ln\frac{\pi}{2}$ C) $e^{\frac{\pi}{2}}$ D) $\frac{\pi}{2}\cdot e$ E) ln2

15. $0<x<\frac{\pi}{2}$,

$f(x)=\ln(\sin x) \Rightarrow f'(x)=?$

A) cosecx B) secx C) tanx D) cotx E) sinx

16. $f(x)=\sin\left(\frac{\pi}{4}\cdot\tan\left(\frac{\pi x}{4}\right)\right) \Rightarrow f'(1)=?$

A) $\frac{\pi\sqrt{2}}{16}$ B) $\frac{\pi^2\sqrt{2}}{16}$ C) $\frac{\pi\sqrt{2}}{8}$ D) $\frac{\pi^2\sqrt{2}}{8}$ E) $\frac{\pi^2\sqrt{2}}{4}$

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1	2	3	4	5	6	7	8
E	C	B	A	D	E	C	B
9	10	11	12	13	14	15	16
D	C	D	A	E	C	D	B

1. $f(x) = e^x \cdot \cos(\ln x) \Rightarrow$ **$f'(1) = ?$**

A) $\frac{1}{e}$ B) 0 C) 1 D) e E) e^2

2. $f(x) = \ln(\cos x) \Rightarrow$ **$f'(\frac{\pi}{3}) = ?$**

A) $-\sqrt{3}$ B) $-\frac{\sqrt{3}}{2}$ C) $\frac{1}{\sqrt{3}}$ D) $\sqrt{3}$ E) $2\sqrt{3}$

3. $f(x) = \tan x^5 \Rightarrow$ **$f'(x) = ?$**

A) $-5x^4 \cdot (1 + \tan^2 x^5)$

B) $5x^4 \cdot (1 + \tan^2 x^5)$

C) $-5x^4 \cdot (1 - \tan^2 x^5)$

D) $5x^4 \cdot (1 - \tan^2 x^5)$

E) $5x^4 \cdot (1 + \tan x^5)$

4. $f(x) = e^{\tan x} \Rightarrow$ **$f'(\frac{\pi}{4}) = ?$**

A) e B) 2e C) 3e D) e^2 E) e^3

5. $f(x) = \ln(\tan x) \Rightarrow$ **$f'(\frac{\pi}{4}) = ?$**

A) 2 B) 4 C) 2e D) e^2 E) e^3

6. $f(x) = \sin(\cos x) \Rightarrow$ **$f'(\frac{\pi}{2}) = ?$**

A) –1 B) 0 C) 1 D) $\frac{\sqrt{2}}{2}$ E) $\frac{\sqrt{3}}{2}$

7. $f(x) = \sin^2 2x \cdot \cos^2 2x \Rightarrow$ **$f'(\frac{\pi}{12}) = ?$**

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{\sqrt{3}}{4}$ C) 0 D) $\frac{\sqrt{3}}{2}$ E) $\frac{\sqrt{3}}{4}$

8. $f(x) = \cos(2^x) \Rightarrow$ **$f'(x) = ?$**

A) $-2^x \cdot \ln 2 \cdot \cos(2^x)$

B) $-2^x \cdot \ln 2 \cdot \sin(2^x)$

C) $-2^x \cdot \cos(2^x)$

D) $2^x \cdot \sin(2^x)$

E) $2^x \cdot \cos(2^x)$

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9. $f(x)=\sqrt{2+\cos 2x} \Rightarrow f'\left(\frac{\pi}{4}\right)=?$

A) $-\frac{1}{\sqrt{2}}$ B) $\frac{\sqrt{2}}{2}$ C) $-\frac{3}{\sqrt{2}}$ D) $-\sqrt{2}$ E) -1

10. $f(x)=\tan(\ln x) \Rightarrow f'(x)=?$

A) $\frac{1+\tan^2 x}{x}$ B) $\frac{1+\tan^2(\ln x)}{x}$ C) $\frac{\tan^2(\ln x)}{x}$ D) $\frac{1+\tan(\ln^2 x)}{x}$ E) $\frac{1+\tan(\ln x)}{x^2}$

11. $0<x<\frac{\pi}{2}$,

$f(\sin x)=\cos 2x \Rightarrow f'\left(\frac{\sqrt{3}}{2}\right)=?$

A) $-2\sqrt{3}$ B) $-\sqrt{3}$ C) $-\frac{\sqrt{3}}{2}$ D) $\sqrt{3}$ E) $2\sqrt{3}$

12. $y=\cos^2 4x \Rightarrow \frac{d^2y}{dx^2}\left(x=\frac{\pi}{8}\right)=?$

A) 4 B) 8 C) 16 D) 24 E) 32

13. $f(x)=1-\cos 2x \Rightarrow f'\left(\frac{\pi}{2}\right)=?$

A) –4 B) –2 C) 0 D) 2 E) 4

14. $f(x)=\cos^4 x-\sin^4 x \Rightarrow f'\left(\frac{\pi}{6}\right)=?$

A) $-\sqrt{3}$ B) $-\frac{\sqrt{3}}{2}$ C) 0 D) $\frac{\sqrt{3}}{2}$ E) $\sqrt{3}$

15. $\left.\begin{array}{l} f(x)=\sin^2 x \\ g(x)=\frac{\pi}{2} \end{array}\right\} \Rightarrow (fog)'(x)=?$

A) $-\frac{\sqrt{2}}{2}$ B) $-\sqrt{3}$ C) 0 D) $\frac{\sqrt{2}}{2}$ E) $\sqrt{3}$

16. $\left.\begin{array}{l} f(x)=\sin 2x \\ g(x)=\cos x \end{array}\right\} \Rightarrow \left(\frac{f(x)}{g(x)}\right)'=?$

A) $\tan^2 x$ B) $-\cos x$ C) $\sin x\cdot\cos x$ D) $2\cdot\cos x$ E) $\sin x$

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1	2	3	4	5	6	7	8
D	A	B	B	A	A	D	B
9	10	11	12	13	14	15	16
A	B	A	E	C	A	C	D

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1. $f(x) = \arcsin(x^2) \Rightarrow$ **$f'(x) = ?$**

A) $\dfrac{2x}{\sqrt{1-x^2}}$ B) $\dfrac{2x}{\sqrt{1-x^4}}$ C) $\dfrac{x^2}{\sqrt{1-x^2}}$ D) $\dfrac{x^2}{\sqrt{1-x^4}}$ E) $\dfrac{x}{\sqrt{1-x^2}}$

2. $0 < x < \frac{\pi}{2}$,

$f(x) = \arcsin(\cos x) \Rightarrow$ **$f'(x) = ?$**

A) -1 B) 0 C) 1 D) tanx E) cotx

3. $f(x) = \arccos(x^2 + 3) \Rightarrow$ **$f'(x) = ?$**

A) $\dfrac{-2x}{\sqrt{x^2+3}}$ B) $\dfrac{-2x}{\sqrt{1-(x^2+3)^2}}$ C) $\dfrac{-2x^2}{\sqrt{1-(x^2+3)}}$ D) $\dfrac{-2x^2}{\sqrt{1-(x^2+3)^2}}$ E) $\dfrac{-2x}{\sqrt{(x^2+3)^2-2}}$

4. $f(x) = \arccos(\tan x) \Rightarrow$ **$f'(x) = ?$**

A) $\dfrac{-1-\tan^2 x}{\sqrt{1-\tan^2 x}}$ B) $\dfrac{1+\tan^2 x}{\sqrt{1-\tan^2 x}}$ C) $\dfrac{1-\tan^2 x}{\sqrt{1-\tan 2x}}$ D) $\dfrac{1-\tan^2 x}{\sqrt{1-\tan^2 x}}$ E) $\dfrac{-1-\tan^2 x}{\sqrt{1-\tan x}}$

5. $f(x) = \arctan(2x^3) \Rightarrow$ **$f'(x) = ?$**

A) $\dfrac{6x^2}{1-4x^6}$ B) $\dfrac{-6x^2}{1+4x^6}$ C) $\dfrac{6x^2}{1+4x^6}$ D) $\dfrac{-6x^2}{1+2x^6}$ E) $\dfrac{6x^2}{1-2x^6}$

6. $f(x) = \arctan e^x \Rightarrow$ **$f'(\ln 2) = ?$**

A) $\frac{e}{5}$ B) $\frac{2e}{5}$ C) $\frac{3e}{5}$ D) $\frac{1}{5}$ E) $\frac{2}{5}$

7. $f(x) = \arccos(4x) \Rightarrow$ **$f'\left(\frac{1}{5}\right) = ?$**

A) $-\frac{20}{3}$ B) $-\frac{16}{3}$ C) $-\frac{8}{3}$ D) $\frac{16}{3}$ E) $\frac{20}{3}$

8. $\frac{\pi}{2} < x < \pi$,

$f(x) = \arccos(\sin x) \Rightarrow$ **$f'(x) = ?$**

A) -1 B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) 1

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9. $f(x) = \arctan(\cos x) \Rightarrow f'\left(\frac{\pi}{6}\right) = ?$

A) $-\frac{1}{7}$ B) $-\frac{2}{7}$ C) $\frac{7}{2}$ D) $\frac{3}{7}$ E) $\frac{5}{7}$

10. $f(x) = \arcsin\sqrt{x} \Rightarrow f'\left(\frac{1}{2}\right) = ?$

A) -1 B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) 1 E) $\frac{3}{2}$

11. $f(x) = \arcsin(\tan x) \Rightarrow f'\left(\frac{\pi}{6}\right) = ?$

A) $\frac{\sqrt{6}}{2}$ B) $\frac{\sqrt{6}}{3}$ C) $\frac{2\sqrt{6}}{3}$ D) $\frac{\sqrt{3}}{2}$ E) $\frac{\sqrt{3}}{3}$

12. $f(x) = \text{arccot}\sqrt{x} \Rightarrow f\left(\frac{1}{9}\right) = ?$

A) $-\frac{18}{5}$ B) $-\frac{27}{20}$ C) $-\frac{5}{3}$ D) $-\frac{3}{5}$ E) $-\frac{1}{3}$

13. $f(x) = \arctan(\sin \pi x) \Rightarrow f'(1) = ?$

A) $-\pi$ B) π C) 1 D) -1 E) 0

14. $f(x) = \arctan(\cos x) \Rightarrow f'\left(\frac{\pi}{2}\right) = ?$

A) -1 B) 0 C) 1 D) $\frac{1}{2}$ E) $\frac{\sqrt{3}}{2}$

15. $f(x) = \text{arccot}(\ln x) \Rightarrow f'\left(\frac{1}{e}\right) = ?$

A) $-\frac{e}{2}$ B) $-e$ C) $\frac{e}{2}$ D) e E) 2e

16. $f(x) = \arccos(\cos x) \Rightarrow f'\left(\frac{\pi}{4}\right) = ?$

A) 0 B) $\frac{\sqrt{2}}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{1}{2}$ E) 1

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	A	B	A	C	E	A	E
9	10	11	12	13	14	15	16
B	D	C	B	A	A	A	E

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1. $f(x) = e^{\sin x} \Rightarrow$ **f′(0) = ?**

A) 2 B) 1 C) $\frac{1}{2}$ D) $\frac{\sqrt{3}}{2}$ E) $-e$

2. $f(x) = 2^{x^2 - 3x + 3} \Rightarrow$ **f′(1) = ?**

A) $-4\ln2$ B) $-2\ln2$ C) $-\ln2$ D) $2\ln2$ E) $3\ln2$

3. $f(x) = 3^{x^3 + 2x} \Rightarrow$ **f′(0) = ?**

A) $-3\ln3$ B) $-2\ln3$ C) $-\ln3$ D) $2\ln3$ E) $3\ln3$

4. $f(x) = 5^{x + 3} \Rightarrow$ **f′(−2) = ?**

A) $\ln5$ B) $2\ln5$ C) $3\ln5$ D) $4\ln5$ E) $5\ln5$

5. $f(x) = \log_3 (x^2 + 3) \Rightarrow$ **f′(1) = ?**

A) $\frac{1}{2}\log_3 e$ B) $\frac{2}{3}\log_3 e$ C) $\frac{1}{4}\log_3 e$ D) $\frac{1}{2}\ln3$ E) $\frac{1}{4}\ln3$

6. $f(x) = \log_5 (x^2 - 2x - 5) \Rightarrow$ **f′(−2) = ?**

A) $-\frac{11}{3}\log_5 e$ B) $-3\log_5 e$ C) $-2\cdot\log_5 e$ D) $3\ln5$ E) $-2\ln5$

7. $f(x) = \log_2 (x^3 - 4x^2 + 4) \Rightarrow$ **f′(−1) = ?**

A) $-9\log_2 e$ B) $-7\log_2 e$ C) $-11\log_2 e$ D) $11\ln2$ E) $-7\ln2$

8. $f(x) = \ln(2x^2 - 3x + 4) \Rightarrow$ **f′(2) = ?**

A) $-\frac{3}{2}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) $\frac{3}{2}$ E) $\frac{5}{6}$

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9. $f(x)=\ln(x^2+4x+5) \Rightarrow f'(1)=?$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

10. $f(x)=\ln\left(\frac{x^3}{x-2}\right) \Rightarrow f'(1)=?$

A) –6 B) –4 C) 4 D) 6 E) 8

11. $f(x) = x \cdot \ln x + e^x + 2 \Rightarrow f'(x) = ?$

A) $\ln x + 1 + e^x$

B) $\ln x + e^x$

C) $\ln x + e^x + 2x$

D) $\ln x + 1 + x \cdot e^{x-1}$

E) $\ln x + 1 + x \cdot e^x$

12. $f(x) = 3^{\ln x} + \ln 9^x \Rightarrow f'(1) = ?$

A) ln27 B) ln9 C) ln3 D) 1 + ln9 E) 1 + ln3

13. $f(x)=\ln\left(\frac{e^x}{e^x+1}\right) \Rightarrow f'(\ln 2)=?$

A) $\frac{1}{6}$ B) $\frac{1}{4}$ C) $\frac{1}{3}$ D) 2 E) 4

14. $f(x) = x^3 \cdot \ln 2x \Rightarrow f'(\frac{e}{2}) = ?$

A) e^3 B) e^2 C) $\frac{e^2}{2}$ D) $3e^2$ E) $\frac{e^2}{4}$

15. $f(x)=\ln(\sin x) \Rightarrow f'\left(\frac{\pi}{6}\right)=?$

A) $-\sqrt{3}$ B) $-\frac{1}{\sqrt{3}}$ C) 1 D) $\frac{1}{\sqrt{3}}$ E) $\sqrt{3}$

16. $f(x)=\ln\left[(x^2+1)^2 \cdot (x^2+x-1)\right] \Rightarrow f'(2)=?$

A) $\frac{5}{13}$ B) $\frac{13}{5}$ C) $\frac{17}{5}$ D) $-\frac{13}{5}$ E) $\frac{18}{5}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	B	D	E	A	C	C	E
9	10	11	12	13	14	15	16
C	C	A	A	C	B	E	B

1. $f(x) = x^3 \cdot \ln x^2 \Rightarrow f'(e) = ?$

A) $5e^2$ B) $6e^2$ C) $7e^2$ D) $8e^2$ E) $10e^2$

2. $f(x) = \frac{\ln x}{x} + x \cdot \ln^2 x \Rightarrow f'(e) = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

3. $f(x) = 5^{x^3} + 5^{2x-1} \Rightarrow f'(1) = ?$

A) 5ln5 B) 8ln5 C) 10ln5 D) 15ln5 E) 25ln5

4. $f(x) = 3^{\cos x} \Rightarrow f'\left(\frac{\pi}{2}\right) = ?$

A) –3ln3 B) –ln3 C) 0 D) ln3 E) 3ln3

5. $f(x) = 2^{\sin x} \cdot e^{\cos x} \Rightarrow f'(0) = ?$

A) e·ln2 B) 3·ln2 C) 2e·ln2 D) $e^2 \cdot \ln 2$ E) ln2 – e

6. $f(x) = x^3 \cdot e^{2x} \Rightarrow f'(2) = ?$

A) $16e^4$ B) $18e^4$ C) $24e^4$ D) $28e^4$ E) $32e^4$

7. $f(x) = x^{\ln x} \Rightarrow f'(x) = ?$

A) $\frac{\ln x}{x} \cdot x^{\ln x}$ B) $\frac{\ln x}{2x} \cdot x^{\ln x}$ C) $\frac{2 \cdot \ln x}{x} \cdot x^{\ln x}$ D) $\frac{\ln x}{x}$ E) $\frac{\ln x}{x} + x$

8. $f(x) = \ln x^3 + \ln^3 x \Rightarrow \left.\frac{dy}{dx}\right|_{x=1} = ?$

A) 1 B) 3 C) 5 D) 7 E) 9

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9. $f(x) = \ln(x^2 + 4) - x \cdot \arctan\frac{x}{2} \Rightarrow$ **f′(2) = ?**

A) $\frac{\pi}{2}$ B) $-\frac{\pi}{4}$ C) $-\frac{\pi}{2}$ D) -1 E) $\frac{1}{4}$

10. $f(x) = \ln e^x + \log_x x^2 \Rightarrow$ **f′(1) + f(e) = ?**

A) 1 B) 2 C) e D) e + 2 E) e + 3

11. $f(x) = \log_3(x^2 + 1) \Rightarrow$ **f′(1) = ?**

A) $\frac{1}{\ln 3}$ B) $\frac{2}{\ln 3}$ C) $\frac{1}{2\ln 3}$ D) $\frac{1}{3\ln 3}$ E) $\frac{\ln 3}{2}$

12. $f(x) = \frac{x-3}{\ln x} \Rightarrow$ **f′(e) = ?**

A) $\frac{1}{e}$ B) $\frac{2}{e}$ C) $\frac{3}{e}$ D) $\frac{e-3}{e}$ E) $\frac{2e-3}{e}$

13. $f(x) = e^{\arctan x} \cdot (x^2 + 1) \Rightarrow$ **f′(x) = ?**

A) $x \cdot e^{\arctan x}$ B) $2x \cdot e^{\arctan x}$

C) $(x + 1) \cdot e^{\arctan x}$ D) $(x + 2) \cdot e^{\arctan x}$

E) $(2x + 1) \cdot e^{\arctan x}$

14. $f(x) = x^{2x} \Rightarrow$ **f′(x) = ?**

A) $x^{2x} \cdot (1 + \ln x)$ B) $x^{2x} \cdot (2 + \ln x)$

C) $x^{2x} \cdot (1 + 2\ln x)$ D) $x^{2x} \cdot (2 + 2\ln x)$

E) $x^{2x} \cdot (2 + \ln 2)$

15. $f(x) = x^{\ln x} \Rightarrow$ **f′(e) = ?**

A) 1 B) 2 C) e D) e^2 E) 2e

16. $f(x) = (4x - 3)^{3x+2} \Rightarrow$ **f′(1) = ?**

A) 7 B) 9 C) 12 D) 15 E) 20

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	D	E	B	A	D	C	B
9	10	11	12	13	14	15	16
B	E	A	C	E	D	B	E

1. $f(x) = 3x^4 - 2x^3 + x^2 - x - 5 \Rightarrow f''(-1) = ?$

A) 24 B) 26 C) 36 D) 48 E) 50

2. $f(x) = \cos 2x \Rightarrow f''(\frac{\pi}{2}) = ?$

A) –26 B) –8 C) 4 D) 8 E) 16

3. $y = (\sin x)^{\cos x} \Rightarrow f'\left(\frac{\pi}{2}\right) = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

4. $x^2 + y^2 - \ln(x+y) = 0 \Rightarrow \frac{dy}{dx}(1,2) = ?$

A) $-\frac{5}{11}$ B) $-\frac{6}{11}$ C) $-\frac{8}{11}$ D) $-\frac{7}{12}$ E) $-\frac{11}{12}$

5. $\left.\begin{array}{l} x = t^2 \cdot \ln t \\ y = \frac{\ln t}{t^2} \end{array}\right\} \Rightarrow \frac{dy}{dx}(t=1) = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

6. $y = f(x) = e^{x^2} \Rightarrow f''(2) = ?$

A) $6e^2$ B) $8e^2$ C) $10e^2$ D) $8e^4$ E) $18e^4$

7. $\arctan x + \ln\left(\frac{x}{y}\right) + 3 = 0 \Rightarrow \frac{dy}{dx}(1,2) = ?$

A) $\frac{5}{6}$ B) $\frac{5}{3}$ C) $\frac{5}{2}$ D) 3 E) 6

8. $f(x) = \sin 2x \Rightarrow \frac{d^{16}y}{dx^{16}} = ?$

A) $-2^{16} \cdot \sin 2x$ B) $-2^8 \cdot \sin 2x$

C) $-2^{16} \cdot \cos 2x$ D) $-2^8 \cdot \cos 2x$

E) $2^{16} \cdot \sin 2x$

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9. $\left.\begin{array}{l} x = t^3 - t \\ y = 3t^2 + 2 \end{array}\right\} \Rightarrow \left.\dfrac{d^2y}{dx^2}\right|_{t=-1} = ?$

A) -3 B) -2 C) $-\frac{3}{2}$ D) -1 E) $-\frac{1}{2}$

10. $y = x^9 + \sin 2x \Rightarrow \left.\dfrac{d^{18}y}{dx^{18}}\right|_{x=\pi/4} = ?$

A) 0 B) $\frac{2^{18}}{\sqrt{2}}$ C) $-\frac{2^{19}}{\sqrt{2}}$ D) -2^{18} E) $2^{18}+9$

11. $y = \ln x \Rightarrow \left.\dfrac{d^{20}y}{dx^{20}}\right|_{x=1} = ?$

A) 20! B) 19! C) –(19!) D) –(20!) E) 21!

12. $f(x) = x^5 - 5x + 1 \Rightarrow f^{(5)}(x) = ?$

A) 60 B) 80 C) 100 D) 120 E) 140

13. $f(x) = x^{89} + e^{2x} + 1 \Rightarrow f^{(100)}(x) = ?$

A) $2^{100} \cdot e^{2x}$ B) $100! + e^{2x}$ C) $\frac{3}{e}$ D) $99! + e^{2x}$ E) 0

14. $y = f(x) = e^{2x} \Rightarrow \dfrac{d^6y}{dx^6} = ?$

A) $12e^{2x}$ B) $24e^{2x}$ C) $32e^{2x}$ D) $48e^{2x}$ E) $64e^{2x}$

15. $f(x) = (\tan x)^x \Rightarrow f'\left(\frac{\pi}{4}\right) = ?$

A) π B) $\frac{\pi}{2}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{6}$ E) $\frac{\pi}{12}$

16. $y = f(x) = \ln(x-2) \Rightarrow \dfrac{d^5y}{dx^5} = ?$

A) $-120\cdot(x-2)^{-5}$ B) $-24\cdot(x-2)^{-5}$ C) $24\cdot(x-2)^{-5}$ D) $64\cdot(x-2)^{-5}$ E) $120\cdot(x-2)^{-5}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	C	C	A	D	E	D	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	D	C	D	A	E	B	C

1. $f(x) = (3x-4)^3 \cdot (-2x+1) \Rightarrow$ **$f'(2) = ?$**

A) –124 B) –92 C) –64 D) 92 E) 124

2. $y^3 - y^2 + 3x^2 - 2x + 5 = 0$

$\Rightarrow \frac{dy}{dx}(1,2) = ?$

A) $-\frac{4}{13}$ B) $-\frac{4}{9}$ C) $-\frac{1}{2}$ D) $\frac{1}{2}$ E) $\frac{4}{9}$

3. $f(x) = \frac{e^x}{e^{-x}+1} \Rightarrow$ **$f'(0) = ?$**

A) $-\frac{3}{4}$ B) $-\frac{1}{2}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) $\frac{3}{4}$

4. $f(x) = (x+m)^2 \cdot (x-1)$,

$f''(1) = 16 \Rightarrow$ **$m = ?$**

A) 2 B) 3 C) 4 D) 6 E) 8

5. $\left.\begin{matrix} x = t^3 - 1 \\ y = t^2 + 2t + 1 \end{matrix}\right\} \Rightarrow \frac{dy}{dx}(x = 7) = ?$

A) $-\frac{3}{2}$ B) –1 C) $-\frac{1}{2}$ D) $\frac{1}{2}$ E) 1

6. $f(x) = \log_2(x^2 + 6x + 10)$,

$f'(a) = 0 \Rightarrow$ **$f(a) = ?$**

A) 0 B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

7. $f\left(\frac{x}{x+1}\right) = x^4 \Rightarrow (f^{-1})'(1) = ?$

A) $-\frac{1}{2}$ B) $-\frac{1}{4}$ C) $\frac{1}{4}$ D) $\frac{1}{16}$ E) $\frac{1}{8}$

8. $t > 0$,

$\left.\begin{matrix} x = t^2 - 1 \\ y = t^3 + 1 \end{matrix}\right\} \Rightarrow \frac{d^2y}{dx^2}(x = 3) = ?$

A) $\frac{3}{2}$ B) $\frac{3}{4}$ C) $\frac{3}{8}$ D) $\frac{4}{3}$ E) $\frac{8}{3}$

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9. $f(x)=8^{x-1} \Rightarrow (f^{-1})'(64)\cdot f'(2)=?$

A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{1}{8}$ D) $\frac{1}{16}$ E) $\frac{1}{32}$

10. $f(x)=10^{(\sin x+\cos x)} \Rightarrow f'\left(\frac{\pi}{2}\right)=?$

A) $-10\ln 10$ B) $-2\ln 10$ C) $-\ln 10$ D) 1 E) 10

11. $f(x)=\ln\left[e^{\sin^2 x}+e^{\cos^2 2x}\right] \Rightarrow f'\left(\frac{\pi}{6}\right)=?$

A) $-\frac{3\sqrt{3}}{4}$ B) $-\frac{2\sqrt{3}}{3}$ C) $-\frac{\sqrt{3}}{4}$ D) $\frac{\sqrt{3}}{4}$ E) $\frac{2\sqrt{3}}{3}$

12. $(f\cdot g)'(x)=3x^2$

$g'(1)=1,$

$f(x)=x^2 \Rightarrow g(1)=?$

A) –2 B) 0 C) 1 D) 2 E) 3

13. $f(x)=\log_5 \tan x+\log_5 \cot x+e^{\sin x} \Rightarrow f'\left(\frac{\pi}{2}\right)=?$

A) –2 B) –1 C) 0 D) 1 E) 2

14. $f(x)=\arcsin x \Rightarrow (f^{-1})'(\pi)=?$

A) –1 B) 0 C) 1 D) 2 E) 3

15. $f(x)=e^{(e^x)} \Rightarrow f'(\ln 2)=?$

A) e B) e^2 C) $2e^2$ D) $4e^2$ E) e^4

16. $f(x)=(\ln x+1)\cdot(e^x+1) \Rightarrow f'(1)=?$

A) e B) e – 1 C) 2e D) 2e + 1 E) e + 1

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	C	E	B	D	A	D	C
9	10	11	12	13	14	15	16
C	A	C	C	C	A	C	D

BÖLÜM CHAPTER 14

TARİHSEL NOT / HISTORICAL NOTE

EMMY AMALIE NOETHER [1882 – 1935]

Soyut cebir ve kuramsal fiziğe çığır açıcı katkılarıyla bilinen bir Alman matematikçidir. Noether'in matematik çalışmaları üç döneme ayrılmıştır. İlkinde (1908-19), cebirsel değişmezler ve sayı alanları üzerine etkin katkılar sağlamıştır. Varyasyonlar hesabındaki diferansiyel sabitler üzerine çalışmaları, Noether teoremi, "modern fiziğin gelişmesine yol gösteren şimdiye kadar kanıtlanmış en önemli matematik teorileri" olarak sayılır. İkinci dönemde (1920–26), "soyut cebri değiştiren" çalışmasına başladı. Yaşamı boyunca ve hatta bugün bile Noether; Pavel Alexandrov, Hermann Weyl, ve Jean Dieudonné gibi matematikçiler tarafından tarihteki en iyi kadın matematikçi olarak gösterildi. Üçüncü döneminde (1927-1935), değişmez cebirler ve hiperkompleks sayılar hakkında çalışmalar yapmıştır ve grupların representation teorisi ve modüller ve idealler teorilerini birleştirmiştir.

She was a German mathematician known for her groundbreaking contributions to abstract algebra and theoretical physics. Noether's mathematical studies are divided into three "periods". In the first (1908-1919), she made effective contributions to algebraic constants and number spaces. Working on differential constants in the calculations of variants, Noether's theorem is counted as "the most important mathematical theories that have proven so far to lead to the development of modern physics". In the second period (1920-1926), she began her "abstract abstraction" study. Noether throughout his life and even today; Pavel Alexandrov, Hermann Weyl, and Jean Dieudonné as the best female mathematician in history. In the third period (1927-1935), she published major works on invariant algebra, hypercomplex numbers, groups representation theory, she also had united modular and ideal theories.

TÜREVİN UYGULAMALARI
APPLICATIONS of DERIVATIVE

Bu bölüm 32 alıştırma sorusu, 53 test sorusu, 14 YÖS sorusu içermektedir.

This chapter includes 32 exercise questions, 53 test questions, and 14 YÖS questions.

BÖLÜM / CHAPTER 14

TÜREVİN UYGULAMALARI / APPLICATIONS of DERIVATIVE

- Türevin Uygulamaları / Applications of Derivative . . . . . . 389 – 402

BÖLÜM 14 CHAPTER

TÜREVİN UYGULAMALARI
APPLICATIONS of DERIVATIVE

1. $\lim\limits_{x \to 2} \dfrac{x^3 - 2x - 4}{x - 2} = ?$

Yanıt / The Answer is 10

2. $\lim\limits_{x \to 2} \dfrac{x^3 - x - 6}{x - 2} = ?$

Yanıt / The Answer is 11

3. $\lim\limits_{x \to y} \dfrac{x^3 - 2x^2y + y^3}{x^2 - xy} = ?$

Yanıt / The Answer is $-y$

4. $\lim\limits_{a \to 1} \dfrac{\sqrt[3]{a^2} - 1}{a - 1} = ?$

Yanıt / The Answer is $\frac{2}{3}$

5. $\lim\limits_{x \to 1} \dfrac{x - 1}{\ln x} = ?$

Yanıt / The Answer is 1

6. $\lim\limits_{x \to 1} \dfrac{e^{2x} - e^2}{1 - e^{x-1}} = ?$

Yanıt / The Answer is $-2e^2$

7. $f(x) = 2x^2 - 10x \Rightarrow \lim\limits_{h \to 0} \dfrac{f(3+h) - f(3)}{h} = ?$

Yanıt / The Answer is 2

8. $f(3x - 5) = 2x^3 - 2 \Rightarrow \lim\limits_{x \to 4} \dfrac{f(x) - f(4)}{x - 4} = ?$

Yanıt / The Answer is 18

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9. $\lim\limits_{x \to \frac{\pi}{4}} \dfrac{\frac{1}{2} - \sin^2 x}{\sin 4x} = ?$

Yanıt / The Answer is $\frac{1}{4}$

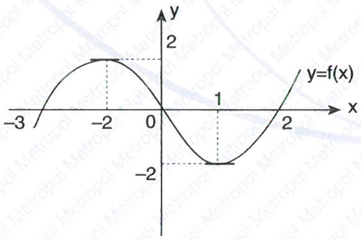
10. $\lim\limits_{x \to \infty} \dfrac{\ln x}{x^3 + x^2} = ?$

Yanıt / The Answer is 0

11. $\lim\limits_{x \to 1} \dfrac{\ln x}{x^2 - 1} = ?$

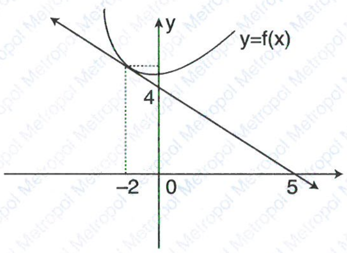
Yanıt / The Answer is $\frac{1}{2}$

12. $\dfrac{f(-2) - f'(-2)}{f(1) - f'(1)} = ?$



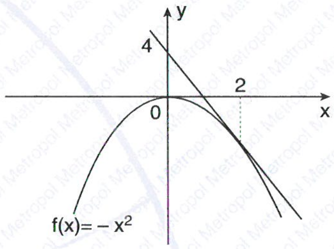
Yanıt / The Answer is –1

13. $f'(-2) = ?$



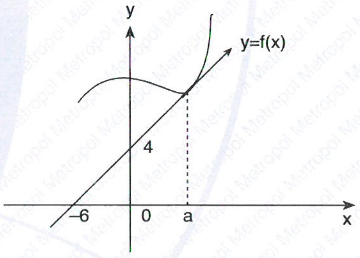
Yanıt / The Answer is $-\frac{4}{5}$

14. $f'(2) = ?$



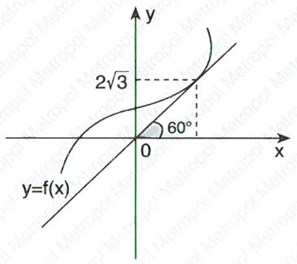
Yanıt / The Answer is –4

15. $f'(a) = ?$



Yanıt / The Answer is $\frac{2}{3}$

16. $g(x) = x^2 \cdot f(x) \Rightarrow g'(2) = ?$



Yanıt / The Answer is $12\sqrt{3}$

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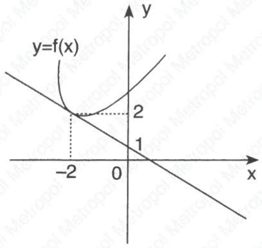
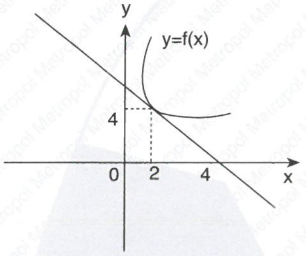
17. $h(x)=\dfrac{x}{f(x)} \Rightarrow \mathbf{h'(-2)=?}$



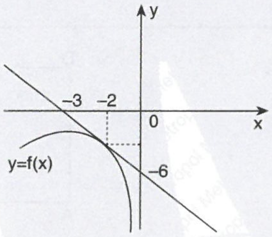
Yanıt / The Answer is $\mathbf{\frac{1}{4}}$

18. $\dfrac{\mathbf{f'(2)}}{\mathbf{f(2)}}=\mathbf{?}$



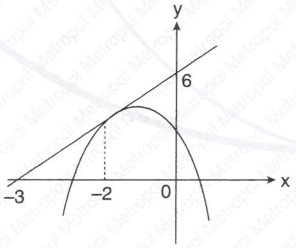
Yanıt / The Answer is $\mathbf{-\frac{1}{2}}$

19. $f'(-2)+\mathbf{f(-2)=?}$



Yanıt / The Answer is **–4**

20. $h(x^3)=f(x)\cdot x \Rightarrow \mathbf{h'(-8)=?}$



Yanıt / The Answer is $\mathbf{-\frac{1}{6}}$

21. $f(x)=2x^3-3x^2-12x+1,$
$f'(x)<0 \Rightarrow \mathbf{ÇK(SS)=?}$

Yanıt / The Answer is **(–1,2)**

22. $f(x)=\dfrac{3x^2}{4}-\dfrac{x^3}{3}+10,$
$f'(x)>0 \Rightarrow \mathbf{ÇK(SS)=?}$

Yanıt / The Answer is $\mathbf{\left(0,\frac{3}{2}\right)}$

23. $f:[-1,3]\to R,\ f(x)=2x^3-6x+9$
$\Rightarrow$ **yerel**(local) **min(f(x)) = ?**

Yanıt / The Answer is **5**

24. $y=2x^3-3x^2-12x+1$
$\Rightarrow$ **yerel**(local) **max(y) = ?**

Yanıt / The Answer is **8**

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25. $y = x^2 + 2x + 1$

$\Rightarrow$ **yerel(local) min(y) = ?**

Yanıt / The Answer is 0

---

26. $x - y = 8 \Rightarrow \min(x \cdot y) = ?$

Yanıt / The Answer is −16

---

27. $3x + y = 40 \Rightarrow \max(x \cdot y) = ?$

Yanıt / The Answer is $\frac{400}{3}$

---

28. $2x + y = 12 \Rightarrow \max(x \cdot y) = ?$

Yanıt / The Answer is 18

---

29. $a \cdot b = 16 \Rightarrow \min(a^2 + b^2) = ?$

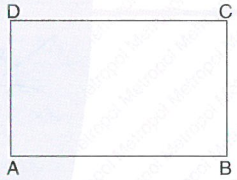
Yanıt / The Answer is 32

---

30. $x + y = 5 \Rightarrow \min(2x^2 + 3y^2) = ?$

Yanıt / The Answer is 30

31.



ABCD bir dikdörtgendir.

ABCD is a rectangle.

Çevre / The perimeter (ABCD) = 40 br (u)

$\Rightarrow$ **max(A(ABCD)) = ? br² (u²)**

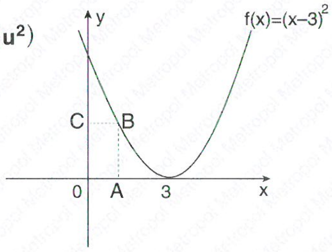
Yanıt / The Answer is 100

---

32. OABC bir dikdörtgendir.

OABC is a rectangle.

$\Rightarrow$ **max(A(OABC)) = ? br² (u²)**



Yanıt / The Answer is 4

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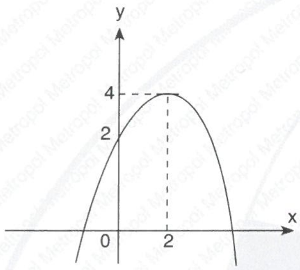
1. $\lim\limits_{x \to \frac{\pi}{6}} \dfrac{1-2\sin x}{\pi - 6x} = ?$

A) $\sqrt{3}$ B) $\frac{\sqrt{3}}{4}$ C) $\frac{\sqrt{3}}{6}$ D) $\frac{1}{2}$ E) 1

2.

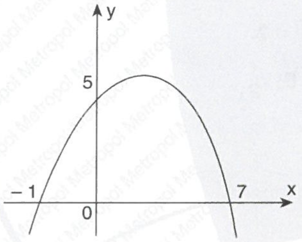


$y = f(x) = ax^2 + bx + c$

$\Rightarrow f'(2) = ?$

A) 0 B) 1 C) $\frac{1}{2}$ D) $\frac{3}{2}$ E) $\frac{2}{3}$

3.



$y = f(x) = ax^2 + bx + c$

$\Rightarrow f'(3) = ?$

A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) 0 D) $\frac{\sqrt{3}}{2}$ E) $-\frac{\sqrt{3}}{2}$

4. $\lim\limits_{x \to \frac{\pi}{2}} \dfrac{\cos^2 x}{1-\sin x} = ?$

A) 0 B) −1 C) 1 D) $-\frac{1}{2}$ E) 2

5. $\lim\limits_{x \to \infty} \dfrac{6x^2 + 3e^x}{3x^2 + e^x} = ?$

A) ∞ B) 1 C) 2 D) 3 E) 6

6. $\lim\limits_{x \to \frac{\pi}{2}} \dfrac{1-\sin x}{x \cdot \cos x} = ?$

A) $\frac{2}{\pi}$ B) $-\frac{2}{\pi}$ C) $\frac{1}{2}$ D) $-\frac{\pi}{2}$ E) 0

7. $\lim\limits_{x \to 0^+} \dfrac{\ln(1-\cos x)}{\cos x} = ?$

A) $-\infty$ B) −1 C) 0 D) 1 E) ∞

8. $\lim\limits_{x \to y} \dfrac{\cos 3y - \cos 3x}{\sin 3y - \sin 3x} = ?$

A) −3 B) 0 C) $\cot 3x$ D) $\cot 3y$ E) $-\tan 3y$

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9. $\lim\limits_{x \to 1} \dfrac{\cos\frac{\pi x}{2}}{1-\sqrt{x}} = ?$

A) 0 B) 1 C) $\frac{1}{\pi}$ D) π E) $\frac{\pi}{2}$

10. $\lim\limits_{x \to 0} \dfrac{e^{2x}-1}{x^2+x} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

11. $\lim\limits_{x \to 0} \dfrac{\ln(x+1)}{2x} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 0 D) 1 E) $\frac{3}{2}$

12. $\lim\limits_{x \to 1} \dfrac{(x+2)^3-27}{1-x} = ?$

A) –81 B) –54 C) –36 D) –27 E) –18

13. $\lim\limits_{x \to 0} \dfrac{x-\sin x}{x\cdot(e^x-1)} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

14. $\lim\limits_{x \to 0} \dfrac{1-\cos(x^2)}{x^4} = ?$

A) $\frac{1}{12}$ B) $\frac{1}{8}$ C) $\frac{1}{6}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

15. $\lim\limits_{x \to 0} \dfrac{1-\cos x}{x^2+x^3} = ?$

A) 0 B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{1}{4}$ E) $\frac{1}{6}$

16. $\lim\limits_{x \to 0} \dfrac{3^{\sin x}-1}{x} = ?$

A) ∞ B) 0 C) 1 D) e E) ln3

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	A	C	E	D	E	A	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	C	B	D	C	E	B	E

1. $\lim\limits_{x \to 0} \dfrac{\cos 2x - \cos 6x}{4x^2} = ?$

A) –8 B) –4 C) 4 D) 8 E) 12

2. $\lim\limits_{x \to 0} \dfrac{\sin^2 6x}{9x^2} = ?$

A) 0 B) $\frac{1}{2}$ C) 4 D) $\frac{2}{3}$ E) $\frac{3}{4}$

3. $\lim\limits_{x \to -y} \dfrac{\cos x - \cos y}{x + y} = ?$

A) 0 B) cosy C) siny D) –siny E) sinx

4. $\lim\limits_{x \to \pi} (2\pi - 2x) \cdot \cot x = ?$

A) 0 B) 1 C) –2 D) $-\infty$ E) 2π

5. $\lim\limits_{x \to 3\pi} \dfrac{\tan \frac{2x}{3}}{\sin(x - 3\pi)} = ?$

A) $-\frac{3}{2}$ B) $-\frac{2}{3}$ C) $-\frac{1}{2}$ D) $\frac{1}{3}$ E) $\frac{2}{3}$

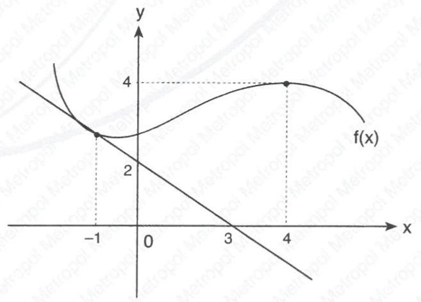
6. $\lim\limits_{x \to 1} (2 - x)^{\frac{1}{x-1}} = ?$

A) $\frac{1}{\sqrt{e}}$ B) 1 C) $\frac{1}{e}$ D) e E) e^2

7. $\lim\limits_{x \to 2} (2 - x) \cdot \tan \frac{\pi x}{4} = ?$

A) $\frac{4}{\pi}$ B) $\frac{3}{\pi}$ C) $\frac{2}{\pi}$ D) $\frac{\pi}{2}$ E) $\frac{\pi}{4}$

8.



$\Rightarrow f'(-1) = ?$

A) $-\frac{2}{3}$ B) $-\frac{1}{3}$ C) $\frac{2}{3}$ D) $\frac{8}{3}$ E) $\frac{10}{3}$

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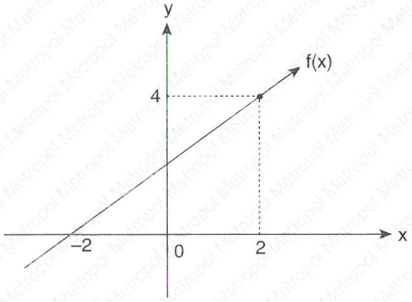
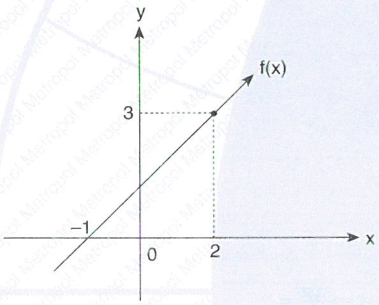
9.



$g(x) = 2x + f(2x^2) \Rightarrow$ **g′(1) = ?**

A) 3 B) 4 C) 6 D) 8 E) 10

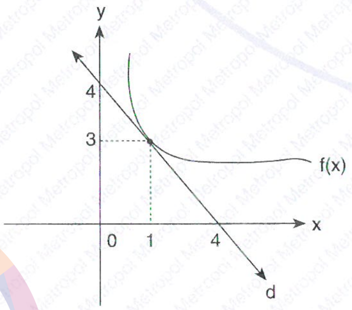
10.



$g(x) = \dfrac{f(x)+2}{x} \Rightarrow \mathbf{g'(2) = ?}$

A) $-\frac{3}{4}$ B) $-\frac{1}{2}$ C) $-\frac{1}{4}$ D) $\frac{1}{2}$ E) $\frac{1}{4}$

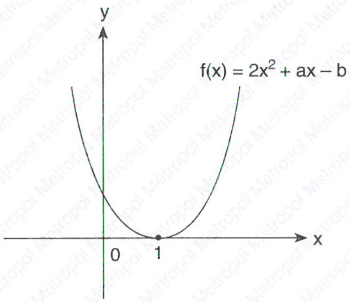
11.



$g(x) = x^2 \cdot f(x) \Rightarrow$ **g′(1) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

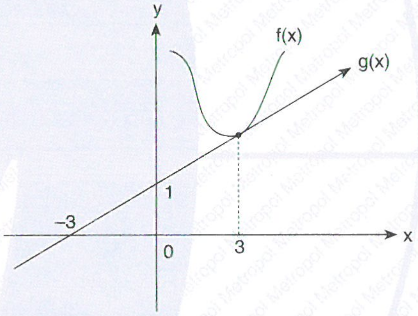
12.



$\Rightarrow$ **a + b = ?**

A) –6 B) –4 C) –2 D) 2 E) 4

13.



$g(x) = \dfrac{2x^2}{f(x)} \Rightarrow \mathbf{g'(3) = ?}$

A) $\frac{9}{4}$ B) $\frac{9}{2}$ C) $\frac{7}{4}$ D) $\frac{7}{2}$ E) $\frac{5}{4}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12	13
C	C	C	C	E	C	A	A	C	A	B	A	B

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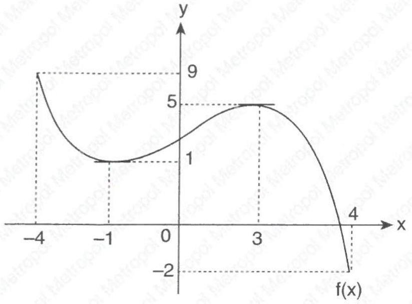
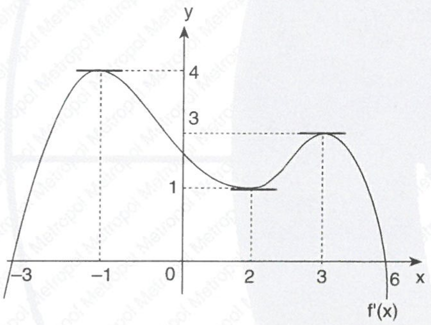
1.



$\Rightarrow$ **$\max(f(x)) + \min(f(x)) = ?$**

A) 14 B) 10 C) 8 D) 7 E) 5

2.



$\Rightarrow$ **$\max(f(x))$ için (for) $x = ?$**

A) –3 B) –1 C) 2 D) 3 E) 6

3. $f(x) = x^3 - 12x^2 + 45x - 1,$

$f'(x) = 0 \Rightarrow \sum x = ?$

A) 4 B) –4 C) –8 D) 8 E) 0

4. $f(x) = x^3 - 3x + 7,$

$f'(x) < 0 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -1)$ B) $(-1, 1)$ C) $(1, \infty)$ D) $(-\infty, 1)$ E) R

5. $f(x) = -4x^3 + 3x^2 - 11,$

$f'(x) > 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\left(0, \frac{1}{2}\right)$ B) $\left(\frac{1}{2}, \infty\right)$ C) $(-\infty, 0)$ D) $\varnothing$ E) $\left(-\infty, \frac{1}{2}\right)$

6. $y = f(x) = \frac{x^4}{4} + x^3 - 12,$

$y' = f'(x) = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\{0\}$ B) $\{-1\}$ C) $\{-3\}$ D) $\{0, 1\}$ E) $\{-3, 0\}$

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7. $y = x^2 - 5x + 6 \Rightarrow$ **yerel(local) min(y)=?**

A) $\frac{25}{4}$ B) $-\frac{1}{4}$ C) $\frac{1}{4}$ D) $-\frac{25}{4}$ E) 6

8. $y = -x^2 - 7x - 12 \Rightarrow$ **yerel(local) max(y)=?**

A) 49 B) $\frac{49}{4}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) $\frac{1}{16}$

9. $y = -x^3 - 9x^2$

$\Rightarrow$ **yerel(local) min (y) + yerel(local) max(y)=?**

A) –36 B) –72 C) –108 D) –144 E) 324

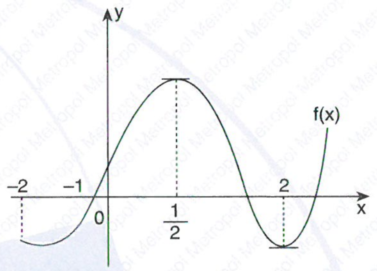
10. $k \in R$,

$f(x) = x^3 - \frac{15}{2} \cdot x^2 + 18x + k$,

$\text{yerel(local)}\max(f(x)) = 12 \Rightarrow$ **k = ?**

A) –4 B) –3 C) –1 D) 0 E) –2

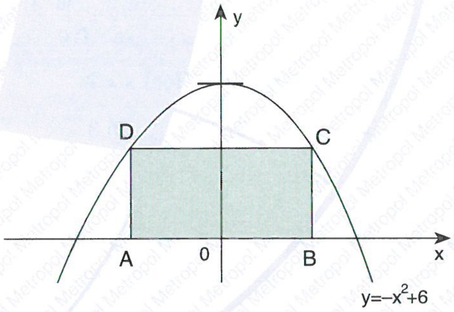
11.



$\Rightarrow$ $\mathbf{f'\left(\frac{1}{2}\right) + f'(2) = ?}$

A) –2 B) –1 C) 0 D) 4 E) 5

12.



ABCD bir dikdörtgendir.

ABCD is a rectangle.

$\Rightarrow$ $\mathbf{\max(A(ABCD)) = ?\ br^2(u^2)}$

A) $2\sqrt{2}$ B) $3\sqrt{2}$ C) $4\sqrt{2}$ D) $6\sqrt{2}$ E) $8\sqrt{2}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
D	E	D	B	A	E	B	C	C	E	C	E

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1. $f:\left[-\frac{1}{2},\infty\right) \to R,\ f(x)=\sqrt{2x+1}$

$\Rightarrow \lim\limits_{x\to 4}\frac{f(x)-f(4)}{x-4}=?$

A) $\frac{1}{6}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) $\frac{2}{3}$ E) $\frac{3}{4}$

2. $a\in R \Rightarrow \left.\frac{d(x^2+a^2)}{dx}\right|_{x=1}=?$

A) $2+2a$ B) $3+a^2$ C) $2a+1$ D) $2a$ E) 2

3. $f(x)=e^{\pi}+x^{e}+e^{x}+\pi^{x} \Rightarrow f'(1)=?$

A) $\pi+2e+\pi\cdot\ln\pi$

B) $\pi+2e+\ln\pi$

C) $2e+\pi\cdot\ln\pi$

D) $e^{\pi}+e+\pi$

E) $e^{\pi}+e+\pi\cdot\ln\pi$

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4. $y=f(x)=e^{mx}$,

$y''-5y'+4y=0 \Rightarrow m\in Z,\ \sum m=?$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $y=f(x)=x\cdot e^{3x}$

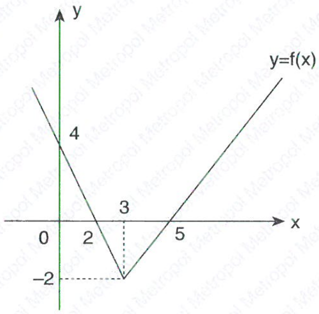
$\Rightarrow e^{-3x}\cdot\frac{d^2y}{dx^2}=?$

A) 9x+6 B) 9x+3 C) 9x D) 9x– 3 E) 9x–6

6. $\left.\frac{d\left((\ln x)^{\ln x}\right)}{dx}\right|_{x=e}=?$

A) e B) $\frac{1}{e}$ C) $\frac{\ln 2}{e}$ D) $\frac{2}{e}$ E) $\frac{1}{e^2}$

7.



$\Rightarrow$ $\mathbf{f'(3^-)+f'(3^+)=?}$

A) −2 B) −1 C) 0 D) 1 E) 2

8. $f(x)=\begin{cases} x^2+3x-1 & , \ x<1 \\ 2\sqrt{x}+x & , \ x\geq 1 \end{cases}$

$\Rightarrow$ $\mathbf{f'(1^-)+f'(1^+)=?}$

A) 7 B) 6 C) 5 D) 4 E) 3

9. $f: R \to R,\ f(x)=\begin{cases} 2x+5 & , \ x<-1 \\ 2x^2+1 & , \ x\geq -1 \end{cases}$

$\Rightarrow \lim\limits_{x\to(-1)^+} \dfrac{\mathbf{f(x)-f(-1)}}{\mathbf{x+1}}=?$

A) −4 B) −3 C) −2 D) −1 E) 0

10. $f(x)=1-x+x^{\frac{2}{3}}$

$\Rightarrow$ $\mathbf{f'(0^+)=?}$

A) $-\infty$ B) −1 C) $-\frac{2}{3}$ D) $\frac{2}{3}$ E) $+\infty$

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11. $f(x)=|x^2+|2x-x^3||$ $\Rightarrow$ $\mathbf{f'(2)=?}$

A) 10 B) 12 C) 14 D) 16 E) 18

12. $P(x)=x^{12}-5x^{10}+7x^5+3$

$\Rightarrow$ $\mathbf{P^{(13)}(x)+P^{(12)}(x)=?}$

A) 0 B) 13! C) 12! D) 13!·12 E) 12!·14

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
B	E	C	E	A	B	B	A	A	E	C	C

1. $y = f(x)$, $f(1) = -1$,

$x^3 + y^2 + xy + 3x - 2y - 6 = 0$

$\Rightarrow \dfrac{df}{dx}(1) = f'(1) = ?$

A) $-\frac{5}{3}$ B) $-\frac{3}{5}$ C) $-\frac{1}{2}$ D) $\frac{2}{3}$ E) $\frac{5}{3}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

2. $f:[3,\infty) \to [-4,\infty)$

$f(x) = x^2 - 5x + 2 \Rightarrow (f^{-1})'(-4) = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

3. $y = \cos(2x-1) \Rightarrow \dfrac{d^{48}y}{dx^{48}} = ?$

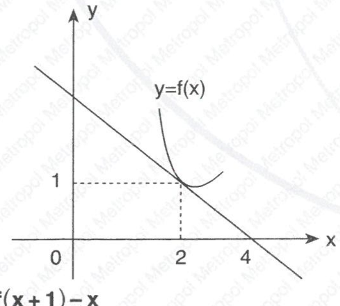
A) $-2^{48} \cdot \sin(2x-1)$ B) $-2^{48} \cdot \cos(2x-1)$

C) $2^{48} \cdot \cos(2x-1)$ D) $2^{48} \cdot \sin(2x-1)$

E) $\sin(2x-1)$

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

4.



$\Rightarrow \lim\limits_{x \to 1} \dfrac{f(x+1) - x}{x^2 - 1} = ?$

A) $\frac{3}{4}$ B) $\frac{3}{8}$ C) $\frac{1}{8}$ D) $-\frac{1}{2}$ E) $-\frac{3}{4}$

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

5. $f(x) = 3x^2 - \sin x \Rightarrow f'(0) = ?$

A) –1 B) 0 C) 1 D) 2 E) 3

[İNÖNÜ ÜNİVERSİTESİ – YÖS 2018]

6. $\left.\begin{array}{l} x = 2\cos 2t \\ y = e^t - t^2 \end{array}\right\} \Rightarrow \dfrac{dy}{dx} = ?$

A) $\dfrac{e^t - 2t}{2\sin 2t}$ B) $e^t - 2t$ C) 2 D) $-4\sin 2t$ E) $-\dfrac{e^t - 2t}{4\sin 2t}$

[İNÖNÜ ÜNİVERSİTESİ – YÖS 2018]

7. $e^{x^2 - y^2} - 3xy - 4 = 0 \Rightarrow \left.\dfrac{dy}{dx}\right|_{\substack{x=1 \\ y=-1}} = ?$

A) –1 B) 1 C) $\frac{7}{2}$ D) 5 E) 6

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

8. $f(x) = x \cdot \ln(xe^x) \cdot e^x$

$\Rightarrow f'(1) = ?$

A) e^2 B) 2e C) 3e D) 4e E) 6e

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

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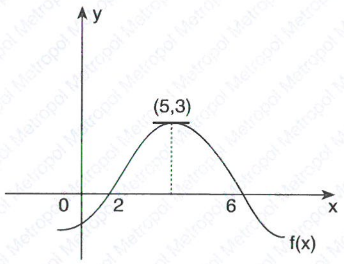
9.



$g(x)=\frac{f(x)}{x} \Rightarrow \mathbf{g'(5)=?}$

A) $-\frac{3}{25}$ B) $-\frac{3}{5}$ C) 0 D) $\frac{3}{5}$ E) $\frac{3}{25}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

10. $y=f(x)$

$\sin^2 2x+\cos^2 y=\sin(x+2y) \Rightarrow \left.\frac{dy}{dx}\right|_{\substack{x=\pi \\ y=\pi}} = ?$

A) –1 B) –2 C) $-\frac{1}{2}$ D) 2 E) $\frac{1}{2}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

11. $f(x)=x-1-|x-1|$

$\Rightarrow \mathbf{f'(-2)+f'(2)=?}$

A) 0 B) 2 C) 3 D) –2 E) –3

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

12. $f(x)=(x-1)(x-2)(x-3)(x-4)(x-5)$

$\Rightarrow \mathbf{f'(3)=?}$

A) 4 B) 3 C) 2 D) 1 E) 0

[EGE ÜNİVERSİTESİ – YÖS 2016]

13. $f(x)=\left(\ln(x+1)+\sin 2x\right)^3+\ xe^x$

$\Rightarrow \mathbf{f'(0)=?}$

A) 0 B) 1 C) ln4 D) 2 E) e

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

14. $x>0$

$f(x^2)=(x^2+3)^3 \Rightarrow \mathbf{f'(1)=?}$

A) 35 B) 40 C) 45 D) 48 E) 52

[EGE ÜNİVERSİTESİ – YÖS 2014]

YANITLAR / ANSWERS

1	2	3	4	5	6	7
E	D	C	E	A	E	D
8	9	10	11	12	13	14
D	A	C	B	A	B	D

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BÖLÜM CHAPTER 15

TARİHSEL NOT / HISTORICAL NOTE

DAVID HILBERT [1862 - 1943]

Alman matematikçi. Geometriyi bir dizi aksiyoma indirgeyen ve matematiğin biçimsel temellerinin oluşturulmasına önemli katkıda bulunan Alman matematikçi David HİLBERT integralli denklemlere ilişkin çalışmalarıyla fonksiyonel analizin 20. yüzyıldaki gelişmesine öncülük etmiştir.

German mathematician. The German mathematician David HİLBERT, who reduced geometry to a number of axioms and contributed significantly to the formal foundations of mathematics, pioneered the development of functional analysis in the 20th century through his work on integral equations.

BELİRSİZ İNTEGRAL
INDEFINITE INTEGRAL

Bu bölüm 64 alıştırma sorusu, 136 test sorusu içermektedir.

This chapter includes 64 exercise questions and 136 test questions.

BÖLÜM / CHAPTER 15

BELİRSİZ İNTEGRAL / INDEFINITE INTEGRAL

- Belirsiz İntegral / Indefinite Integral .... 405 – 432

BELİRSİZ İNTEGRAL
INDEFINITE INTEGRAL

1. $\int dx = ?$

Yanıt / The Answer is $x + C$

2. $\int 5dx = ?$

Yanıt / The Answer is $5x + C$

3. $\int 4dy = ?$

Yanıt / The Answer is $4y + C$

4. $\int xdx = ?$

Yanıt / The Answer is $\frac{x^2}{2} + C$

5. $\int 3xdx = ?$

Yanıt / The Answer is $\frac{3x^2}{2} + C$

6. $\int xdy = ?$

Yanıt / The Answer is $x \cdot y + C$

7. $\int x^3dy = ?$

Yanıt / The Answer is $x^3 \cdot y + C$

8. $\int x^4dx = ?$

Yanıt / The Answer is $\frac{x^5}{5} + C$

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9. $\int (x^2 + x)dx = ?$

Yanıt / The Answer is $\frac{x^3}{3} + \frac{x^2}{2} + C$

10. $\int 3x^8 dx = ?$

Yanıt / The Answer is $\frac{x^9}{3} + C$

11. $\int e^x dx = ?$

Yanıt / The Answer is $e^x + C$

12. $\int \sin x dx = ?$

Yanıt / The Answer is $-\cos x + C$

13. $\int \cos x dx = ?$

Yanıt / The Answer is $\sin x + C$

14. $\int \frac{1}{\cos^2 x} dx = ?$

Yanıt / The Answer is $\tan x + C$

15. $\int \sec^2 x dx = ?$

Yanıt / The Answer is $\tan x + C$

16. $\int -\csc^2 x dx = ?$

Yanıt / The Answer is $\cot x + C$

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17. $\int \frac{1}{\sin^2 x} dx = ?$

Yanıt / The Answer is $-\cot x + C$

18. $\int \frac{2}{1+x^2} dx = ?$

Yanıt / The Answer is $2 \cdot \arctan x + C$

19. $\int \frac{4}{1+x^2} dx = ?$

Yanıt / The Answer is $-4 \cdot \text{arccot}\, x + C$

20. $\int \frac{5}{\sqrt{1-x^2}} dx = ?$

Yanıt / The Answer is $5 \cdot \arcsin x + C$

21. $\int \frac{dx}{x} = ?$

Yanıt / The Answer is $\ln|x| + C$

22. $\int \frac{4}{x} dx = ?$

Yanıt / The Answer is $4 \cdot \ln|x| + C$

23. $\int 5^x dx = ?$

Yanıt / The Answer is $\frac{5^x}{\ln 5} + C$

24. $\int \frac{12^x}{\log_{12} e} = ?$

Yanıt / The Answer is $12^x + C$

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25. $\int \left(x^2+\frac{1}{x^2}+e^x\right)dx = ?$

Yanıt / The Answer is $\frac{x^3}{3}-\frac{1}{x}+e^x+C$

26. $\int (x+3)^2 dx = ?$

Yanıt / The Answer is $\frac{x^3}{3}+3x^2+9x+C$

27. $\int (x-2)^5 dx = ?$

Yanıt / The Answer is $\frac{(x-2)^6}{6}+C$

28. $\int (x^2+x)\cdot(2x+1)dx = ?$

Yanıt / The Answer is $\frac{(x^2+x)^2}{2}+C$

29. $\int (x^3+2x^2)\cdot(3x^2+4x)dx = ?$

Yanıt / The Answer is $\frac{(x^3+2x)^2}{2}+C$

30. $\int \frac{dx}{ax+b} = \frac{1}{a}\ln|ax+b|$

$\Rightarrow \int \frac{dx}{2x+5} = ?$

Yanıt / The Answer is $\frac{1}{2}\ln|2x+5|+C$

31. $\int \frac{dx}{4x} = ?$

Yanıt / The Answer is $\frac{1}{4}\cdot \ln|x|+C$

32. $\int \cos(ax+b)dx = \frac{1}{a}\cdot\sin(ax+b)$

$\Rightarrow \int \cos(3x+5)dx = ?$

Yanıt / The Answer is $\frac{1}{3}\cdot\sin(3x+5)+C$

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33. $\int \cos(4x)dx = ?$

Yanıt / The Answer is $\frac{1}{4}\sin(4x)+C$

34. $\int \sin(7x+12)dx = ?$

Yanıt / The Answer is $-\frac{1}{7}\cos(7x+12)+C$

35. $\int e^{ax+b}dx = \frac{1}{a}\cdot e^{ax+b}+C$

$\Rightarrow \int e^{3x+4}dx = ?$

Yanıt / The Answer is $\frac{1}{3}\cdot e^{3x+4}+C$

36. $\int e^{5x}dx = ?$

Yanıt / The Answer is $\frac{1}{5}e^{5x}+C$

37. $\int e^{x^2}\cdot 2x\,dx = ?$

Yanıt / The Answer is $e^{x^2}+C$

38. $\int e^{\tan x}(1+\tan^2 x)dx = ?$

Yanıt / The Answer is $e^{\tan x}+C$

39. $\int \sin^4 x\cdot \cos x\,dx = ?$

Yanıt / The Answer is $\frac{\sin^5 x}{5}+C$

40. $\int \ln x\cdot \frac{1}{x}dx = ?$

Yanıt / The Answer is $\frac{\ln^2|x|}{2}+C$

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41. $\int \frac{\arctan x}{1+x^2}dx = ?$

Yanıt / The Answer is $\frac{\arctan^2 x}{2} + C$

42. $\int \frac{\arcsin x}{\sqrt{1-x^2}}dx = ?$

Yanıt / The Answer is $\frac{\arcsin^2 x}{2} + C$

43. $\int \frac{x+1}{x^2-1}dx = ?$

Yanıt / The Answer is $\ln|x-1| + C$

44. $\int \frac{2x^2+5x+4}{x} = ?$

Yanıt / The Answer is $x^2 + 5x + 4\ln|x| + C$

45. $\int \frac{x^2+x+1}{x^3-1}dx = ?$

Yanıt / The Answer is $\ln|x-1| + C$

46. $\int \frac{\sin x}{\cos x}dx = ?$

Yanıt / The Answer is $-\ln|\cos x| + C$

47. $\int \frac{e^x}{e^x+5}dx = ?$

Yanıt / The Answer is $\ln|e^x + 5| + C$

48. $\int \frac{dx}{(x+4)\cdot\ln(x+4)} = ?$

Yanıt / The Answer is $\ln|\ln|x+4|| + C$

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49. $\int e^{\tan x} \cdot \sec^2 x dx = ?$

Yanıt / The Answer is $e^{\tan x} + C$

50. $\int e^{4\ln x} dx = ?$

Yanıt / The Answer is $\frac{x^5}{5} + C$

51. $\int \frac{dx}{a^2 + b^2x^2} = \frac{1}{a \cdot b} \arctan \frac{ax}{b} + C$

$\Rightarrow \int \frac{dx}{1 + 9x^2} = ?$

Yanıt / The Answer is $\frac{1}{3} \arctan 3x + C$

52. $\int \frac{dx}{16 + 4x^2} = ?$

Yanıt / The Answer is $\frac{1}{8} \arctan \frac{x}{2} + C$

53. $\int \frac{3^x}{1 + 3^{2x}} dx = ?$

Yanıt / The Answer is $\frac{1}{\ln 3} \arctan 3^x + C$

54. $\int \frac{\sin x}{1 + \cos^2 x} dx = ?$

Yanıt / The Answer is $-\arctan(\cos x) + C$

55. $\int \frac{dx}{x^2 + 4x + 5} = ?$

Yanıt / The Answer is $\arctan(x + 2) + C$

56. $\int \frac{dx}{x^2 + 6x + 10} = ?$

Yanıt / The Answer is $\arctan(x + 3) + C$

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57. $\int \frac{dx}{\sqrt{1-9x^2}} = ?$

Yanıt / The Answer is $\frac{1}{3}\arcsin 3x + C$

58. $\int \frac{dx}{\sqrt{16-x^2}} = ?$

Yanıt / The Answer is $\arcsin\frac{x}{4} + C$

59. $\int \frac{dx}{\sqrt{16-9x^2}} = ?$

Yanıt / The Answer is $\frac{1}{3}\arcsin\frac{3x}{4} + C$

60. $\int \frac{xdx}{\sqrt{1-x^4}} = ?$

Yanıt / The Answer is $\frac{1}{2}\arcsin x^2 + C$

61. $\int \frac{1+\tan^2 x}{\sqrt{1-\tan^2 x}}dx = ?$

Yanıt / The Answer is arcsin(tanx) + C

62. $\int \frac{dx}{x^2-9} = ?$

Yanıt / The Answer is $\frac{1}{6}\ln\left|\frac{x-3}{x+3}\right| + C$

63. $\int \frac{dx}{x^2-16} = ?$

Yanıt / The Answer is $\frac{1}{8}\ln\left|\frac{x-4}{x+4}\right| + C$

64. $\int \frac{dx}{x^2-25} = ?$

Yanıt / The Answer is $\frac{1}{10}\ln\left|\frac{x-5}{x+5}\right| + C$

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1. $\left.\begin{matrix} f'(x) = x + 1 \\ f(2) = -1 \end{matrix}\right\} \Rightarrow$ **f(0) = ?**

A) –5 B) –4 C) –2 D) –1 E) 0

2. $\left.\begin{matrix} f'(x) = 3x^2 + 2x \\ f(1) = 3 \end{matrix}\right\} \Rightarrow$ **f(–1) = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

3. $f'(x) = 3x^2 - 2x + 1$,

$f(0) = 4 \Rightarrow$ **f(–2) = ?**

A) –4 B) –8 C) –10 D) –12 E) –16

4. $f(x) = \int (x^2 - 2x)\,dx$,

$f(3) = 6 \Rightarrow$ **f(6) = ?**

A) 36 B) 38 C) 39 D) 42 E) 45

5. $\int x^2 \cdot f(x)\,dx = 5x^4 + 1 \Rightarrow$ **f(1) = ?**

A) 20 B) 12 C) 8 D) $\frac{7}{5}$ E) $\frac{6}{5}$

6. $\left.\begin{matrix} f''(x) = 6x - 2 \\ f'(0) = 4 \\ f(0) = 1 \end{matrix}\right\} \Rightarrow$ **f(1) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

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7. $\int 4x^4 dx = ?$

A) $\frac{x^6}{6} + C$ B) $\frac{4x^3}{3} + C$ C) $\frac{3x^4}{4} + C$ D) $x^4 + C$ E) $\frac{4}{5}x^5 + C$

8. $\int (4x^2 + 6x + 5)dx = ?$

A) $\frac{4x^3}{3} + 3x^2 + 5x + C$

B) $4x^3 + 3x^2 + 5x + C$

C) $\frac{4x^2}{3} + 3x + 5 + C$

D) $3x^3 + 2x^2 + 5x + C$

E) $\frac{3x^3}{2} + 2x^2 + 5x + C$

9. $\int \left(x+2+\frac{1}{x^2}\right)dx = ?$

A) $\frac{x^2}{2}+2x-\frac{1}{x}+C$

B) $2x^2+\frac{x}{2}-\frac{1}{x}+C$

C) $\frac{x^2}{2}+x+\frac{1}{x}+C$

D) $2x^2+2x-\frac{1}{x}+C$

E) $\frac{x^2}{2}+2x+\frac{1}{x}+C$

10. $\int (x-1)\cdot(x+1)dx = ?$

A) $\frac{x^2}{2}-x+C$

B) $\frac{x^3}{3}-2x+C$

C) $\frac{x^2}{2}+x+\frac{1}{x}+C$

D) $\frac{x^3}{3}-x+C$

E) $\frac{x^3}{3}+2x+C$

11. $\int (x-2)\cdot(x^2+2x+4)dx = ?$

A) $\frac{x^4}{4}-\frac{x^3}{3}+C$

B) $\frac{x^4}{4}-4x+C$

C) $\frac{x^4}{4}-8x+C$

D) $\frac{x^4}{4}+\frac{x^3}{3}+C$

E) $\frac{x^4}{4}+8x+C$

12. $\int \left(x^2+3x+\frac{1}{x}\right)dx = ?$

A) $2x^2+3+C$

B) $x^3+3x^2+\frac{1}{x^2}+C$

C) $\frac{x^3}{3}+\frac{3x^2}{2}-\frac{1}{x^2}+C$

D) $\frac{x^3}{3}+\frac{3x^2}{2}+\ln|x|+C$

E) $3x^3+6x^2+\ln|x|+C$

13. $\int \frac{(x+1)^2}{x^3}dx = ?$

A) $\ln|x|-2x-\frac{x^2}{2}+C$

B) $\ln|x|-\frac{2}{x}-\frac{1}{2x^2}+C$

C) $\ln|x|-\frac{2}{x}-\frac{1}{x^2}+C$

D) $\ln|x|+\frac{2}{x}-\frac{1}{x^2}+C$

E) $\ln|x|-\frac{2}{x}-\frac{2}{x^2}+C$

14. $\int \frac{3x^3+4x^2+1}{x}dx = ?$

A) $x^3+4x^2+2\cdot\ln|x|+C$

B) $x+3\arctan x+C$

C) $x^2+2x+4\cdot\ln|x|+C$

D) $x^3+2x^2+\ln|x|+C$

E) $x+4\ln(x^2+1)+C$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7
A	D	C	D	A	B	E
8	9	10	11	12	13	14
A	A	D	C	D	B	D

1. $\int (x+1)\cdot\sqrt{x}\,dx = ?$

A) $\frac{2x^{\frac{5}{2}}}{5}+C$ B) $\frac{5}{2}x^{\frac{5}{2}}+C$ C) $\left(\frac{x^2}{2}+x\right)\sqrt{x}+C$

D) $\left(\frac{x^2}{5}+x\right)+\sqrt{x}+C$ E) $\frac{2}{5}x^2\sqrt{x}+\frac{2}{3}x\sqrt{x}+C$

2. $\int\left(\frac{1}{\sqrt[5]{x^3}}-\frac{1}{5}\right)dx = ?$

A) $\frac{5\cdot\sqrt[5]{x^2}}{2}-\frac{\sqrt{x}}{5}+C$ B) $\frac{\sqrt[5]{x^2}}{5}-\frac{x}{5}+C$

C) $\frac{5}{2}\cdot\sqrt[5]{x^2}-\frac{x}{5}+C$ D) $\frac{2}{7}\sqrt{x}+\frac{2}{3}x^3+C$

E) $\frac{2}{5}\cdot\sqrt[5]{x^2}-\frac{5}{x}+C$

3. $\int\frac{(x^2-2)^2}{x}dx = ?$

A) $\frac{x^4}{4}-x^2+4\ln|x|+C$ B) $\frac{x^2}{4}-2x^2+2\ln|x|+C$

C) $\frac{x^4}{4}-2x^2+4\ln|x|+C$ D) $\frac{x^4}{2}-2x^2+4\ln|x|+C$

E) $\frac{x^4}{2}-x^2\ln|x|+C$

4. $\int\sqrt{x^2+3}\cdot x\,dx = ?$

A) $\frac{(x^2+3)^{\frac{1}{2}}}{3}+C$ B) $\frac{(x^2+3)^{\frac{1}{2}}}{2}+C$

C) $\frac{2(x+3)^{\frac{3}{2}}}{3}+C$ D) $\frac{(x^2+3)^{\frac{3}{2}}}{3}+C$

E) $\frac{(x^2+3)^{\frac{3}{2}}}{2}+C$

5. $\int e^{3x+2}dx = ?$

A) $\frac{1}{2}e^{3x+2}+C$ B) $\frac{1}{3}e^{3x+2}+C$ C) $\frac{1}{3}e^{3x}+C$

D) $e^{3x+2}+C$ E) $e^{3x}+C$

6. $\int(e^x+\sin x)dx = ?$

A) $e^x+\cos x+C$

B) $e^x-\cos x+C$

C) $e^x+\cos x+C$

D) $2e^x+\cos x+C$

E) $\frac{1}{2}e^x-\cos x+C$

7. $\int\left(e^x+3^x-\frac{2}{x}\right)dx = ?$

A) $e^x+3^x-2\ln|x|+C$

B) $e^x+3^x\cdot\log_3 e-2\ln|x|+C$

C) $e^x+3^x\ln 3-2\ln|x|+C$

D) $e^x+3^x-\ln|x|+C$

E) $e^x+3^x\cdot\log_3 e+2\ln|x|+C$

8. $\int\tan x\,dx = ?$

A) $-\ln(\cos x)+C$ B) $\ln(\cos x)+C$

C) $\ln(\sin x)+C$ D) $\tan^2 x+C$

E) $\cot x+C$

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9. $\int \frac{1}{\sec x} dx = ?$

A) sinx + C
B) cosx + C
C) tanx + C
D) cotx + C
E) cosecx + C

10. $\int (\sin^2 x + e^x + \cos^2 x) dx = ?$

A) $\frac{1}{x^2} + e^x + C$
B) $\frac{1}{x} + e^x + C$
C) $x^2 + e^x + C$
D) $x + e^x + C$
E) $\frac{1}{x^2} + e^x + C$

11. $\int (3 + \sin^2 x \cdot \text{cosec}\, x) dx = ?$

A) 3x + cosx + C
B) 3x + sinx + C
C) 3x − cosx + C
D) 3x − sinx + C
E) 3x + tanx + C

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12. $\int (e^x - e^{-x} + e^{2x}) dx = ?$

A) $e^x - e^{-x} + e^{2x} + C$
B) $e^x + e^{-x} + \frac{1}{2} \cdot e^{2x} + C$
C) $e^x - e^{-x} - \frac{1}{2} \cdot e^{2x} + C$
D) $e^{2x} + e^{-2x} + \frac{e^{2x}}{2} + C$
E) $e^{-2x} - e^{2x} + e^{3x} + C$

13. $\int (3t^2 + 2) \cdot e^{t^3 + 2t} dt = ?$

A) $e^{t^3 + 2t} + C$
B) $e^{t^3 - 2t} + C$
C) $\frac{e^{t^3 + 2t}}{3} + C$
D) $3 \cdot e^{t^3 + 2t} + C$
E) $\frac{e^{t^3 + 2t}}{9} + C$

14. $\int \sec^2 3x \cdot e^{\tan 3x} dx = ?$

A) $e^{\tan x} + C$
B) $e^{\tan 3x} + C$
C) $\frac{e^{\tan 3x}}{3} + C$
D) $\frac{e^{\tan x}}{3} + C$
E) $e^{3\tan x} + C$

YANITLAR / ANSWERS

1	2	3	4	5	6	7
E	C	C	D	B	B	B
8	9	10	11	12	13	14
A	A	D	C	B	A	C

1. $\int \sin(2x-3)dx = ?$

A) $\frac{1}{2}\cos(2x+3)+C$
B) $-\frac{1}{2}\cos(2x-3)+C$
C) $-\cos(2x+3)+C$
D) $\cos(2x+3)+C$
E) $\cos(2x)+C$

2. $\int \cos(3x+5)dx = ?$

A) $\sin(3x+5)+C$
B) $\frac{\sin(3x+5)}{3}+C$
C) $\frac{\cos(3x+5)}{3}+C$
D) $-\cos(3x+5)+C$
E) $\sin^2(3x+5)+C$

3. $\int 3\cdot\cos(3x-2)dx = ?$

A) $\cos(3x-2)+C$
B) $\sin(3x-2)+C$
C) $\frac{1}{3}\cos(3x-2)+C$
D) $\frac{1}{3}\sin(3x-2)+C$
E) $\frac{1}{9}\sin(3x-2)+C$

4. $\int \left(6x^2-\frac{1}{\sqrt{1-x^2}}+\frac{1}{1+x^2}\right)dx = ?$

A) $2x^3 - \arcsin x + \arctan x + C$
B) $3x^2 - \sin x + \arctan x + C$
C) $2x^3 + \arcsin x + \tan x + C$
D) $3x^2 - \arcsin x + \text{arccot}x + C$
E) $2x^3 + \arcsin x - \arctan x + C$

5. $\int \frac{dx}{4+x^2} = ?$

A) $\frac{1}{4}\arctan\frac{x}{2}+C$
B) $\frac{1}{2}\arctan\frac{x}{2}+C$
C) $-\frac{1}{2}\arctan x+C$
D) $-\frac{1}{4}\arctan\frac{x}{2}+C$
E) $\arctan x+C$

6. $\int \frac{1}{25+4x^2}dx = ?$

A) $-\frac{1}{10}\arctan\frac{2x}{5}+C$
B) $-\frac{1}{10}\arctan\frac{x}{5}+C$
C) $\frac{1}{10}\arctan\frac{2x}{5}+C$
D) $\frac{1}{10}\arctan\frac{x}{5}+C$
E) $\frac{4}{25}\arctan x+C$

7. $\int \frac{1}{\sqrt{4-x^2}}dx = ?$

A) $-\frac{1}{2}\arcsin\frac{x}{2}+C$
B) $-2\arcsin\frac{x}{2}+C$
C) $\frac{1}{2}\arcsin\frac{x}{2}+C$
D) $\arcsin\frac{x}{2}+C$
E) $2\arcsin\frac{x}{2}+C$

8. $\int \left(\frac{4}{1+x^2}+\frac{5}{\sqrt{1-x^2}}\right)dx = ?$

A) $\arctan x+\arcsin x+C$
B) $4\cdot\arctan x+5\cdot\arcsin x+C$
C) $4\cdot\arcsin x+5\cdot\arctan x+C$
D) $4\cdot\ln(1+x^2)-\frac{5}{2}\ln(1-x^2)+C$
E) $4\cdot\ln(1+x^2)+5\cdot\ln(\sqrt{1-x^2})+C$

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9. $\int \frac{x+4}{x-1}dx = ?$

A) $x + \ln|x-1| + C$

B) $\frac{x^2}{2} + \ln|x-1| + C$

C) $3x + \ln|x+1| + C$

D) $x + 5\cdot\ln|x-1| + C$

E) $x + \ln|x+1|^3 + C$

10. $\int \frac{3x+8}{x+2}dx = ?$

A) $3x + 2\ln|x+2| + C$

B) $2x + \ln|3x+8| + C$

C) $\arctan\left(\frac{x+1}{2}\right) + C$

D) $2\cdot\arctan\left(\frac{x+1}{2}\right) + C$

E) $\frac{1}{2}\arctan\left(\frac{x+1}{2}\right) + C$

11. $\int \frac{x^2+2x+3}{x+1}dx = ?$

A) $\frac{x^2}{2} + x + 2\ln|x+1| + C$

B) $\frac{x^2}{2} + x + 2\cdot\ln|x-1| + C$

C) $\frac{x^2}{2} + x + \ln(x+1)^2 + C$

D) $x + \ln(x+1)^2 + C$

E) $x + \arctan x + C$

12. $\int \frac{x^2}{x^2+1}dx = ?$

A) $x + \ln|x^2+1| + C$

B) $\frac{x^2}{2} + \ln|x^2+1| + C$

C) $x - \arctan(x^2+1) + C$

D) $x + \arctan x + C$

E) $x - \arctan x + C$

13. $\int \frac{1}{5+x^2+2x}dx = ?$

A) $\frac{1}{2}\arctan\left(\frac{x}{2}\right) + C$

B) $\frac{1}{2}\arctan x + C$

C) $\arctan\left(\frac{x+1}{2}\right) + C$

D) $2\cdot\arctan\left(\frac{x+1}{2}\right) + C$

E) $\frac{1}{2}\arctan\left(\frac{x+1}{2}\right) + C$

14. $\int \frac{dx}{x^2+6x+10} = ?$

A) $\arctan(x+3) + C$

B) $\text{arccot}(x+3) + C$

C) $\arcsin(x^2+6x+10) + C$

D) $\arccos(x+3) + C$

E) $\arctan(x^2+6x+10) + C$

YANITLAR / ANSWERS

1	2	3	4	5	6	7
B	B	B	A	B	C	D
8	**9**	**10**	**11**	**12**	**13**	**14**
B	D	A	A	E	E	A

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1. $\int \frac{dx}{x^2-1} = ?$

A) $\frac{1}{2}\ln\left|\frac{x-1}{x+1}\right| + C$
B) $\arctan x + C$
C) $\frac{1}{2}\ln\left|\frac{x+1}{x-1}\right| + C$
D) $\frac{x}{x^2-1} + C$
E) $\ln\left|\frac{x+1}{x^2-1}\right| + C$

2. $\int \frac{5}{x^2+x-6}dx = ?$

A) $\ln\left|\frac{x-2}{x+3}\right| + C$
B) $5\ln\left|\frac{x-2}{x+3}\right| + C$
C) $\ln\left|\frac{x+3}{x-2}\right| + C$
D) $5\ln\left|\frac{x+3}{x-2}\right| + C$
E) $3\ln\left|\frac{x-2}{x+3}\right| + C$

3. $\int \frac{2x+3}{x^2-5x+6}dx = ?$

A) $7\ln|x-3| - 9\ln|x-2| + C$
B) $7\ln|x-3| + 9\ln|x-2| + C$
C) $9\ln|x-3| + 7\ln|x-2| + C$
D) $9\ln|x-3| - 7\ln|x-2| + C$
E) $9\ln|x-2| - 7\ln|x-3| + C$

4. $\int \frac{7dx}{x^2-x-12} = ?$

A) $\ln\left|\frac{x+4}{x+3}\right| + C$
B) $\ln\left|\frac{x+3}{x+4}\right| + C$
C) $\ln\left|\frac{x-3}{x+4}\right| + C$
D) $\ln\left|\frac{x-4}{x+3}\right| + C$
E) $\ln\left|\frac{x-4}{x-3}\right| + C$

5. $\int \frac{(x+10)dx}{x^2-x-2} = ?$

A) $4\ln|x-2| - 3\ln|x+1| + C$
B) $4\ln|x-2| + 3\ln|x+1| + C$
C) $4\ln|x+2| - 3\ln|x-1| + C$
D) $4\ln|x-1| + 3\ln|x-2| + C$
E) $4\ln|x-1| - 3\ln|x+2| + C$

6. $\int \frac{dx}{x^2+2x+2} = ?$

A) $\arctan x + C$
B) $2\arctan x + C$
C) $\arctan(x+1) + C$
D) $2\arctan(x+1) + C$
E) $\arctan(x+2) + C$

7. $\int \frac{2dx}{x^2-4x+5} = ?$

A) $\arctan(x-4) + C$
B) $\arctan(x+4) + C$
C) $2\arctan(x-4) + C$
D) $2\arctan(x+2) + C$
E) $2\arctan(x-2) + C$

8. $\int \frac{(x+1)dx}{x^2+4x-5} = ?$

A) $\frac{2}{3}\ln|x+5| + \frac{1}{3}\ln|x-1| + C$
B) $\frac{2}{3}\ln|x-5| + \frac{1}{3}\ln|x-1| + C$
C) $\frac{2}{3}\ln\left|\frac{x+5}{x-1}\right| + C$
D) $\frac{1}{3}\ln|(x-5)(x-1)| + C$
E) $\ln|x-5| + \ln|x-1| + C$

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9. $\int \frac{x\,dx}{x^2+4x-5} = ?$

A) $\frac{1}{6}\ln\left|(x+5)^5\cdot(x-1)\right|+C$

B) $\frac{1}{3}\ln\left|(x+5)^2\cdot(x-1)\right|+C$

C) $\frac{1}{2}\ln\left|(x+5)(x-1)\right|+C$

D) $\ln|x+5|+C$

E) $\ln|x-1|+C$

10. $\int \frac{2x^2+4x-4}{x^2-2}dx = ?$

A) $2x - \ln|x^2-2| + C$

B) $2x + \ln|x^2-2| + C$

C) $2x + 2\ln|x^2-2| + C$

D) $\ln|x^2-2| - 2x + C$

E) $\ln|x^2-2| + x + C$

11. $\int \frac{3x^3+x^2-x}{x^2}dx = ?$

A) $\frac{3}{2}x^2 + x + \ln|x| + C$

B) $\frac{3}{2}x^2 + x - \ln|x| + C$

C) $3x^2 + \frac{x}{2} - \ln|x| + C$

D) $x^2 + x + \ln|x| + C$

E) $x^2 - x - \ln|x| + C$

12. $\int \frac{e^{\arctan 2x}}{1+4x^2}dx = ?$

A) $e^{\arctan 2x}+C$

B) $\frac{e^{\arctan 2x}}{2}+C$

C) $\frac{e^{\arctan x}}{2}+C$

D) $e^{\arctan x}+C$

E) $-e^{\arctan 2x}+C$

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13. $\int \frac{x^2\cdot\arctan x^3}{1+x^6}dx = ?$

A) $(\arctan x^3)^2+C$

B) $\frac{(\arctan x^3)^2}{3}+C$

C) $\frac{(\arctan x^3)^2}{6}+C$

D) $\arctan x^3+C$

E) $-\frac{\arctan x^3}{6}+C$

14. $\int \frac{1}{\sqrt{x}(\sqrt{x}+1)}dx = ?$

A) $\frac{2x^{\frac{2}{3}}}{3}+x+C$

B) $\ln|x+1|+C$

C) $\ln\sqrt{x}+C$

D) $2\cdot\ln|\sqrt{x}+1|+C$

E) $\frac{1}{2}\ln(\sqrt{x}+1)+C$

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1	2	3	4	5	6	7
A	A	D	D	A	C	E
8	9	10	11	12	13	14
A	A	C	B	B	C	D

1. $\int (x+4)^3 \cdot dx = ?$

A) $\frac{(x+4)^3}{3}+C$ B) $\frac{(x+4)^4}{4}+C$ C) $(x+4)^4+C$

D) $3(x+4)^2+C$ E) $\frac{(x+4)^5}{5}+C$

2. $\int (2x+1)^{10}dx = ?$

A) $\frac{(2x+1)^{11}}{11}+C$ B) $\frac{(2x+1)^{11}}{22}+C$

C) $\frac{(2x+1)^{10}}{10}+C$ D) $\frac{(2x+4)^{11}}{20}+C$

E) $\frac{(2x+1)^{10}}{22}+C$

3. $\int (x^2+5)^6 \cdot 2xdx = ?$

A) $\frac{(x^2+5)^5}{5}+C$ B) $\frac{(x^2+5)^6}{6}+C$

C) $\frac{(x^2+5)^7}{7}+C$ D) $\frac{(x^2+5)^7}{2}+C$

E) $\frac{x(x^2+5)^6}{6}+C$

4. $\int (x^2+x)^5 \cdot (2x+1)dx = ?$

A) $\left(\frac{x^3}{3}+\frac{x^3}{2}\right)^5+C$ B) $(x^2+x)^5+C$

C) $\frac{(x^2+x)^6}{6}+C$ D) $\left(\frac{x^2+x}{5}\right)^5+C$

E) $\frac{5}{6}(x^2+x)+C$

5. $\int \frac{xdx}{3x^2+4} = ?$

A) $\frac{1}{3}\ln|3x^2+4|+C$

B) $\frac{1}{4}\ln|3x^2+4|+C$

C) $\frac{1}{3}\ln|3x^2|+C$

D) $\frac{1}{4}\ln|3x^2|+C$

E) $\frac{1}{6}\ln|3x^2+4|+C$

6. $\int \frac{6x^2+4}{\sqrt{x^3+2x+1}}dx = ?$

A) $\sqrt{x^3+2x+1}+C$ B) $2\sqrt{x^3+2x+1}+C$

C) $3\sqrt{x^3+2x+1}+C$ D) $4\sqrt{x^3+2x+1}+C$

E) $6\sqrt{x^3+2x+1}+C$

7. $\int 3 \cdot 2^{3x}dx = ?$

A) $\frac{3 \cdot 2^{3x}}{\ln 2}+C$ B) $\frac{2^{3x}}{3\ln 2}+C$

C) $\frac{2^{3x}}{\ln 2}+C$ D) $2^{3x} \cdot \ln 2+c$

E) $x-\cos(\ln x)+C$

8. $\int f(x) \cdot f'(x)dx = ?$

A) $f(x)+C$ B) $f'(x)+C$

C) $\frac{f^2(x)}{2}+C$ D) $\frac{f'(x)}{2}+C$

E) $\frac{f(x)}{2}+C$

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9. $\int \sin(\cos x)\cdot \sin x\, dx = ?$

A) sin(cosx) + C
B) cos(cosx) +C
C) –cos(cosx) + C
D) –sin(cosx) + C
E) cos(sinx) + C

10. $\int \cos(x^2+x)\cdot(2x+1)dx = ?$

A) $\sin(x^2+x)+C$
B) $\frac{\cos(x^2+x)}{4}+C$
C) $\cos(x^2+x)+C$
D) $\frac{\cos^2(x^2+x)}{2}+C$
E) $-\sin(x^2+x)+C$

11. $\int \cos^2 2x \cdot \sin 2x dx = ?$

A) $-\frac{\sin^3 2x}{3}+C$
B) $-\frac{\sin^4 2x}{4}+C$
C) $-\frac{\cos^3 2x}{6}+C$
D) $\frac{\sin^3 2x}{3}+C$
E) $-\frac{\cos^4 2x}{6}+C$

12. $\int \sin^3 x \cdot d(\sin x) = ?$

A) $\frac{\sin^2 x}{2}+C$
B) $\frac{\sin^3 x}{3}+C$
C) $\frac{\sin^4 x}{4}+C$
D) $\frac{-\cos^3 x}{3}+C$
E) $\frac{-\cos^4 x}{4}+C$

13. $\int \cos^3 x \cdot d(\cos x) = ?$

A) $\cos^4 x + C$
B) $\frac{\cos^4 x}{4}+C$
C) $-\frac{\cos^4 x}{4}+C$
D) $\cos^3 x \cdot \sin x + C$
E) $\frac{\sin^4 x}{4}+C$

14. $\int \sin^3 x \cdot \cos x\, dx = ?$

A) $\sin^3 x + C$
B) $\frac{\cos^4 x}{4}+C$
C) $\cos^3 x + C$
D) $\sin^3 x \cdot \cos x + C$
E) $\frac{\sin^4 x}{4}+C$

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1	2	3	4	5	6	7
B	B	C	C	E	D	C
8	9	10	11	12	13	14
C	B	A	C	C	B	E

1. $\int e^{f(x)} \cdot f'(x)dx = ?$

A) $e^{f(x)} + C$ B) $e^{x} + C$ C) $\ln(f(x)) + C$ D) $e^{x} + x + C$ E) $e^{f(x)} \cdot f'(x) + C$

2. $\int 3^{\tan x} \cdot \sec^2 x dx = ?$

A) $\frac{3^{\tan x}}{\ln 3} + C$ B) $\frac{3^{\cot x}}{\ln 3} + C$ C) $\frac{-3^{\tan x}}{\ln 3} + C$ D) $\frac{-3^{\cot x}}{\ln 3} + C$ E) $\frac{3^{\tan x}}{\sec x} + C$

3. $\int 3x^3 \cdot e^{4x^4+1} dx = ?$

A) $e^{x^3} + C$ B) $-\frac{3}{16}e^{x^3+x} + C$ C) $\frac{3}{16}e^{x^3+x} + C$ D) $\frac{3}{16}e^{4x^4+1} + C$ E) $-\frac{3}{16}e^{4x^4+1} + C$

4. $\int e^{\cos x} \cdot \sin x \, dx = ?$

A) $-e^{\cos x} + C$ B) $-e^{\sin x} + C$ C) $e^{\cos x} + C$ D) $e^{\sin x} + C$ E) $e^{\tan x} + C$

5. $\int e^{\tan x} \cdot \sec^2 x \, dx = ?$

A) $-e^{\tan x} + C$ B) $-e^{\cot x} + C$ C) $e^{\tan x} + C$ D) $e^{\sec x} + C$ E) $e^{\sec^2 x} + C$

6. $\int e^{(e^{2x})} \cdot e^{2x} dx = ?$

A) $\frac{1}{2}e^{2x} + C$ B) $-e^{2x} + C$ C) $-\frac{1}{2}e^{2x} + C$ D) $\frac{1}{2}e^{(e^{x})} + C$ E) $\frac{1}{2}e^{(e^{2x})} + C$

7. $\int e^{x} \cdot \cos e^{x} dx = ?$

A) $\sin e^{x} + C$ B) $\cos e^{x} + C$ C) $e^{x} . \sin e^{x} + C$ D) $-\sin e^{x} + C$ E) $-\cos e^{x} + C$

8. $\int \frac{dx}{x \cdot \ln x} = ?$

A) $\ln|\ln x| + C$ B) $x \cdot \ln x + C$ C) $\ln x + C$ D) $\frac{1}{\ln x} + C$ E) $\frac{\ln x}{x} + C$

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9. $\int \frac{dx}{x\cdot(\ln x)^3}=?$

A) $-\frac{1}{\ln x}+C$
B) $-\frac{1}{\ln^2 x}+C$
C) $-\frac{1}{2\ln^2 x}+C$
D) $\frac{2}{\ln^2 x}+C$
E) $\frac{2}{\ln x}+C$

10. $\int \frac{\ln^3 x}{x}dx=?$

A) $\ln^3 x+C$
B) $\frac{\ln^3 x}{3}+C$
C) $\frac{\ln^4 x}{4}+C$
D) $\frac{\ln^3 x}{x}+C$
E) $\ln^3 x-x+C$

11. $\int \frac{\ln^5 x}{x}dx=?$

A) $\frac{1}{4}\ln^4|x|+C$
B) $\frac{1}{5}\ln^5|x|+C$
C) $\frac{1}{6}\ln^6|x|+C$
D) $\ln^5|x|+C$
E) $\ln^6|x|+C$

12. $\int \frac{e^x+2}{e^x+2x+3}dx=?$

A) $\ln|e^x+2x|+C$
B) $\ln|e^x+2x+3|+C$
C) $-\ln|e^x+2x+3|+C$
D) $\frac{(e^x+2x+3)}{2}+C$
E) $\ln e^x+2+C$

13. $\int \frac{dx}{\cos^2(2x+3)}=?$

A) $-\frac{1}{2}\tan(2x+3)+C$
B) $-\frac{1}{3}\tan(2x+3)+C$
C) $\frac{1}{2}\tan(2x+3)+C$
D) $\frac{1}{3}\tan(2x+3)+C$
E) $\frac{1}{6}\tan(2x+3)+C$

14. $\int \frac{\arctan x}{1+x^2}dx=?$

A) $\arctan x+C$
B) $\frac{\arctan^2 x}{2}+C$
C) $\arctan x+x+C$
D) $\frac{3\cdot \operatorname{arccot} x}{x^3}+C$
E) $\ln|\arctan x|+C$

15. $\int \frac{\arcsin x}{\sqrt{1-x^2}}dx=?$

A) $\frac{\arcsin^2 x}{2}+C$
B) $-\frac{\arcsin^2 x}{2}+C$
C) $\frac{\arcsin x}{2}+C$
D) $\frac{\arcsin x}{4}+C$
E) $\frac{\arcsin^2 x}{4}+C$

16. $\int \frac{2x\,dx}{(1+x^4)\cdot \arctan x^2}=?$

A) $x+\frac{x^5}{5}+C$
B) $\frac{\arctan x}{2}+C$
C) $\frac{\arctan x^2}{2}+C$
D) $\ln(\arctan x)+C$
E) $\ln|\arctan x^2|+C$

YANITLAR / ANSWERS

1	2	3	4	5	6	7
A	A	D	A	C	E	A
8	9	10	11	12	13	14
A	C	C	C	B	C	B

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1. $\int \frac{\text{arccot}\,x}{x^2+1}dx = ?$

A) $\frac{1}{2}\text{arccot}x + C$
B) $\frac{1}{2}\cot x + C$
C) $\frac{1}{2}\cot^2 x + C$
D) $-\frac{1}{2}\text{arccot}^2 x + C$
E) $\text{arccot}^2 x + C$

2. $\int \frac{e^x}{\sqrt{1-e^{2x}}}dx = ?$

A) $\frac{1}{2}\text{arcsin}e^x + C$
B) $\frac{1}{2}\text{arcsin}e^{2x} + C$
C) $\text{arcsin}e^x + C$
D) $\text{arcsin}e^{2x} + C$
E) $2\text{arcsin}e^x + C$

3. $\int \frac{e^{\arcsin x}}{\sqrt{1-x^2}}dx = ?$

A) $e^x + C$
B) $e^{\sin x} + C$
C) $-e^{\sin x} + C$
D) $-e^{\arcsin x} + C$
E) $e^{\arcsin x} + C$

4. $\int \frac{2^x}{\sqrt{1-4^x}}dx = ?$

A) $\arcsin 2^x + C$
B) $\arcsin 4^x + C$
C) $\frac{(\arcsin 2^x)^2}{2} + C$
D) $\frac{1}{\ln 2}\arcsin 2^x + C$
E) $-\frac{1}{\ln 2}\arcsin 2^x + C$

5. $\int \frac{\sin 2x}{\sqrt{1+\sin^2 x}}dx = ?$

A) $2\cdot(1+\sin^2 x)^{\frac{1}{2}} + C$
B) $-2\cdot(1+\sin x^2) + C$
C) $2\cdot(1+\sin x^2) + C$
D) $-2\cdot(1+\sin x^2) + C$
E) $\frac{(1+\sin x^2)}{2} + C$

6. $\int \frac{e^t}{1+e^{2t}}dt = ?$

A) $\text{arcsin}e^t + C$
B) $\text{arccos}e^t + C$
C) $\text{arctan}e^t + C$
D) $\text{arccot}e^t + C$
E) $\text{arcsin}e^{2t} + C$

7. $\int \frac{x}{\sin^2(x^2-3)}dx = ?$

A) $\frac{1}{2}\cot(x^2-3) + C$
B) $-\frac{1}{2}\cot(x^2-3) + C$
C) $2\cdot\cot(x^2-3) + C$
D) $-2\cdot\cot(x^2-3) + C$
E) $\frac{1}{2}\tan(x^2-3) + C$

8. $\int \left(\frac{\cos 2x}{\cos^2 x - \frac{1}{2}} + \tan^2 x\right)dx = ?$

A) $2x + \tan x + C$
B) $x + \tan x + C$
C) $3x + \tan x + C$
D) $4x + \tan x + C$
E) $x + 2\tan x + C$

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9. $\int \frac{\tan x}{\sin(2x)}dx = ?$

A) $\frac{\sin x}{2} + C$

B) $\frac{\cos x}{2} + C$

C) $\frac{1}{\sec x} + C$

D) $\frac{1}{\operatorname{cosec} x} + C$

E) $\frac{\tan x}{2} + C$

10. $\int \sin^3 2x \cdot \sin 4x\, dx = ?$

A) $\frac{(\sin 2x)^5}{5} + C$

B) $\frac{\sin^4 6x}{4} + C$

C) $\frac{\sin 4x}{4} + C$

D) $\frac{4(\sin 2x)^3}{5} + C$

E) $\frac{5(\sin 2x)^5}{4} + C$

11. $\int \sin^2(2x-1)dx = ?$

A) $\frac{x}{2} - \frac{1}{8}\sin(4x-2) + C$

B) $\frac{x}{2} - \frac{1}{8}\sin(2x-1) + C$

C) $\frac{2x-1}{4} - \frac{1}{4}\sin(4x-2) + C$

D) $\frac{x}{2} - \frac{1}{4}\sin(4x-2) + C$

E) $\frac{x}{2} - \frac{1}{2}\sin(2x-1) + C$

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12. $\int (\cot^4 x + \cot^2 x)dx = ?$

A) $\frac{1}{2}\cot^2 x + C$

B) $-\frac{1}{3}\cot^3 x + C$

C) $\frac{1}{3}\cot^3 x + C$

D) $\cot^3 x + C$

E) $\cot^2 x + C$

13. $\int (\tan^4 x + \tan^2 x)dx = ?$

A) $\frac{1}{2}\tan^2 x + C$

B) $\frac{1}{3}\tan^3 x + C$

C) $\frac{1}{4}\tan^4 x + C$

D) $\tan^3 x + C$

E) $\tan^4 x + C$

14. $\int (\tan^5 x + \tan^3 x)dx = ?$

A) $\tan^2 x + C$

B) $\tan^3 x + C$

C) $\frac{\tan^2 x}{2} + C$

D) $\frac{\tan^2 x}{3} + C$

E) $\frac{\tan^4 x}{4} + C$

YANITLAR / ANSWERS

1	2	3	4	5	6	7
D	C	E	D	A	C	B
8	9	10	11	12	13	14
B	E	A	A	B	B	E

1. $\int \frac{2x}{1+x^4}dx = ?$

A) arctanx + C
B) arctanx^2 + C
C) 2arctanx + C
D) 2arctanx^2 + C
E) arctan2x + C

2. $\int \frac{3dx}{\sqrt{1-9x^2}} = ?$

A) $\frac{1}{3}\text{arcsin}3x + C$
B) $\text{arcsin}\frac{x}{3} + C$
C) $\frac{1}{3}\text{arcsin}\frac{x}{3} + C$
D) $\text{arcsin}x + C$
E) $\text{arcsin}3x + C$

3. $\int \frac{x \cdot dx}{\sqrt{1-16x^4}} = ?$

A) $8\text{arcsin}4x^2 + C$
B) $4\text{arcsin}4x^2 + C$
C) $\frac{1}{8}\text{arcsin}4x^2 + C$
D) $\frac{1}{4}\text{arcsin}4x^2 + C$
E) $\frac{1}{16}\text{arcsin}4x^2 + C$

4. $\int \frac{\sin(\ln x)}{x}dx = ?$

A) $-\cos(\ln x) + C$
B) $-\sin(\ln x) + C$
C) $\cos(\ln x) + C$
D) $\sin(\ln x) + C$
E) $x - \cos(\ln x) + C$

5. $\int \sin^2 x\, dx = ?$

A) $\frac{x}{2} - \frac{\sin 2x}{4} + C$
B) $\frac{x}{2} + \frac{\sin 2x}{4} + C$
C) $\frac{x}{2} - \frac{\sin 2x}{2} + C$
D) $\frac{x}{2} + \frac{\sin 2x}{2} + C$
E) $\frac{x}{2} - \sin 2x + C$

6. $\int \cos^3 x\, dx = ?$

A) $\sin x - \frac{\sin^2 x}{2} + C$
B) $\sin x + \frac{\sin^2 x}{2} + C$
C) $\cos x - \frac{\cos^2 x}{2} + C$
D) $\cos x + \frac{\cos^2 x}{2} + C$
E) $\sin x - \frac{\sin^3 x}{3} + C$

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7. $\int \sin^5 x\,dx = ?$

A) $-\cos x + \frac{2}{3}\cos^3 x - \frac{\cos^5 x}{5} + C$

B) $\sin x - \frac{\sin^3 x}{3} + \frac{\sin^5 x}{5} + C$

C) $x - \frac{2}{3}\sin^3 x + \frac{\sin^5 x}{5} + C$

D) $x - \frac{\sin^3 x}{3} + \frac{\sin^5 x}{5} + C$

E) $x + \frac{\sin^3 x}{3} - \frac{\sin^5 x}{5} + C$

8. $f'(x) = \frac{1}{e^x},\ f(\ln 2) = 0 \Rightarrow f(x) = ?$

A) $-e^{-x}$

B) $e^{-x} + 1$

C) $-e^{-x} + \frac{1}{2}$

D) $-e^{-x} - \frac{1}{2}$

E) $-e^{-x} - 1$

9. $\int x \cdot e^{5x^2}\,dx = ?$

A) $e^{5x^2} + C$

B) $\frac{e^{5x^2}}{5} + C$

C) $\frac{e^{5x^2}}{10} + C$

D) $\frac{e^{5x^2}}{20} + C$

E) $\frac{e^{5x^2}}{25} + C$

10. $f'(x) = \frac{\ln x}{x},\ f(e^4) = -4 \Rightarrow f(x) = ?$

A) $\ln^2 x + 6$

B) $\ln^2 x + 1$

C) $\ln^2 x - 12$

D) $\frac{1}{2}\ln^2 x - 12$

E) $\ln^2 x + 12$

11. $\int \frac{6}{\sqrt{9 - 4x^2}}\,dx = ?$

A) $\arcsin 2x + C$

B) $3 \cdot \arcsin 2x + C$

C) $3 \cdot \arcsin \frac{2x}{3} + C$

D) $\arccos 2x + C$

E) $\arccos \frac{2x}{3} + C$

12. $f'(x) = \frac{\ln^3 x}{3x},\ f(e^2) = 2 \Rightarrow f(x) = ?$

A) $\ln^4 x$

B) $\frac{\ln^4 x}{12}$

C) $\ln^3 x + 3$

D) $\frac{\ln^4 x}{12} - 5$

E) $\frac{\ln^4 x}{12} + \frac{2}{3}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
B	E	C	A	A	E	A	C	C	D	C	E

1. $\int \frac{\sin 2x}{\cos^2 x} dx = ?$

A) $2\cos x + C$

B) $\ln|\cos x| + C$

C) $2\ln|\cos x| + C$

D) $-2\ln|\cos x| + C$

E) $\frac{\ln|\cos x|}{2} + C$

2. $\int \sin^2 x \cdot \cos^3 x dx = ?$

A) $\frac{\cos^2 x}{2} - \frac{\cos^4 x}{4} + C$

B) $\frac{\sin^3 x}{3} - \frac{\sin^5 x}{5} + C$

C) $\sin x - \frac{\sin^2 x}{4} + C$

D) $\frac{\sin^3 x}{3} - \frac{\cos^4 x}{4} + C$

E) $\frac{\sin^2 x}{2} + \frac{\cos^3 x}{3} + C$

3. $\int \sin^3 x \cdot \cos^3 x \, dx = ?$

A) $\frac{\cos^6 x}{6} - \frac{\cos^4 x}{4} + C$

B) $\frac{\sin^6 x}{6} - \frac{\sin^4 x}{4} + C$

C) $\frac{\cos^6 x}{6} + \frac{\cos^4 x}{4} + C$

D) $-\frac{\sin^6 x}{6} + \frac{\sin^4 x}{4} + C$

E) $\frac{\cos^6 x}{6} - \frac{\sin^4 x}{4} + C$

4. $\int \frac{\cos x}{1 + \sin^2 x} = ?$

A) ln(1+ sin²x) + C

B) ln(sinx) + C

C) arctan(1+ sinx) + C

D) arctan(sinx) + C

E) ln(arctanx) + C

5. $\int \frac{\cos x}{1 + 4\sin^2 x} dx = ?$

A) $\arctan(\sin x) + C$

B) $\arctan(\sin 2x) + C$

C) $\frac{\arctan(2\sin x)}{2} + C$

D) $\arctan(2\sin x) + C$

E) $2 \cdot \arctan(\sin 2x) + C$

6. $0 < x < \frac{\pi}{2} \Rightarrow \int \sqrt{1 + \sin 2x} \, dx = ?$

A) $\cos x + \sin x + C$

B) $\cos x - \sin x + C$

C) $\sin x - \cos x + C$

D) $\frac{\sin^2 x}{2} - \frac{\cos^2 x}{2} + C$

E) $\frac{\sin 2x}{2} - \cos x + C$

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7. $\int \cos 5x \cdot \cos x dx = ?$

A) $\frac{1}{12}\sin 6x - \frac{1}{8}\sin 4x + C$

B) $\frac{1}{12}\sin 6x + \frac{1}{8}\sin 4x + C$

C) $\frac{1}{12}\cos 6x - \frac{1}{8}\cos 4x + C$

D) $\frac{1}{12}\cos 6x + \frac{1}{8}\cos 4x + C$

E) $-\frac{1}{12}\sin 6x + \frac{1}{8}\sin 4x + C$

8. $\int \sin 3x \cdot \sin x dx = ?$

A) $\frac{1}{8} \cdot \cos 4x - \frac{1}{4}\cos 2x + C$

B) $\frac{1}{8} \cos 4x + \frac{1}{4}\cos 2x + C$

C) $\frac{1}{8} \sin 4x - \frac{1}{4}\sin 2x + C$

D) $\frac{1}{8}\sin 4x + \frac{1}{4}\sin 2x + C$

E) $-\frac{1}{8}\sin 4x + \frac{1}{4}\sin 2x + C$

9. $\int \sin 4x \cdot \cos 4x dx = ?$

A) $\frac{\cos 8x}{8} + C$

B) $\frac{\cos 8x}{16} + C$

C) $\frac{-\cos 8x}{16} + C$

D) $\frac{\sin 8x}{8} + C$

E) $\frac{\sin 8x}{16} + C$

10. $\int \sin 6x \cdot \cos 2x dx = ?$

A) $\frac{\sin 8x}{8} + \frac{\sin 4x}{4} + C$

B) $\frac{\sin 8x}{16} + \frac{\sin 4x}{8} + C$

C) $\frac{\cos 8x}{8} + \frac{\cos 4x}{4} + C$

D) $\frac{\cos 8x}{16} + \frac{\cos 4x}{8} + C$

E) $\frac{-\cos 8x}{16} - \frac{\cos 4x}{8} + C$

11. $\int \sin x \cdot \cos x dx = ?$

A) $\frac{1}{4} \cdot \cos 2x + C$

B) $\frac{1}{4} \cdot \sin 2x + C$

C) $\frac{1}{2} \cdot \cos 2x + C$

D) $\frac{-1}{4}\cos 2x + C$

E) $-\frac{1}{4} \cdot \sin 2x + C$

12. $\int \frac{\cos^3 u}{\sin^2 u} du = ?$

A) $-\sec u - \cos u + C$

B) $-\operatorname{cosec} u - \sin u + C$

C) $-\cot u + \tan u + C$

D) $-\cot u - \sec u + C$

E) $-\operatorname{cosec} u + \sin u + C$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
D	B	D	D	C	C	B	E	C	E	D	B

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1. $\int \ln x dx = ?$

A) $x \cdot \ln x - x + C$
B) $x \cdot \ln x - x^2 + C$
C) $\frac{x^2}{2} \ln x - \frac{x^4}{4} + C$
D) $x \cdot \ln x + x + C$
E) $x \cdot \ln x + \frac{x^2}{2} + C$

2. $\int x \cdot e^x dx = ?$

A) $e^x \cdot (x+1) + C$
B) $e^x \cdot (x-1) + C$
C) $e^x (x-2) + C$
D) $e^x (x+2) + C$
E) $e^x (x+4) + C$

3. $\int x \cdot e^{2x} dx = ?$

A) $\frac{1}{2} e^{2x} - \frac{1}{2} e^{2x} + C$
B) $\frac{x}{2} e^{2x} - \frac{1}{2} e^{2x} + C$
C) $\frac{1}{2} e^{2x} + \frac{1}{2} e^{2x} + C$
D) $\frac{x}{2} e^{2x} + \frac{1}{2} e^{2x} + C$
E) $\frac{x}{2} e^{2x} - \frac{1}{4} e^{2x} + C$

4. $\int x \cdot \ln x dx = ?$

A) $\frac{x^2}{2}\left(\ln x - \frac{1}{2}\right) + C$
B) $\frac{x^2}{2}\left(\ln x + \frac{1}{2}\right) + C$
C) $\frac{x^2}{2}(\ln x - 1) + C$
D) $\frac{x^2}{2}(\ln x + 1) + C$
E) $x^2(\ln x - 1) + C$

5. $\int x^2 \cdot \ln x dx = ?$

A) $x^2 \ln x - x^2 + C$
B) $x^3 \ln x - x^3 + C$
C) $\frac{x^3 \ln x}{3} - \frac{x^3}{2} + C$
D) $\frac{x^3 \ln x}{3} - \frac{x^3}{9} + C$
E) $x^2 \ln x - \arctan x + C$

6. $\int e^x \cdot (x^2 + x + 1) dx = ?$

A) $e^x \cdot (x^2 + x + 1) + C$
B) $e^x \cdot (x^2 - x + 2) + C$
C) $e^x \cdot (2x + 1) + C$
D) $e^x \cdot (x^2 + x + 2) + C$
E) $e^x \cdot (x^2 + 3x + 4) + C$

7. $\int 7x^2 \cdot \ln 4x dx = ?$

A) $\frac{x^3 \cdot \ln 4x}{3} - \frac{x^3}{3} + C$
B) $\frac{x^2 \cdot \ln 4x}{2} - \frac{x^2}{2} + C$
C) $\frac{x^3 \ln 4x}{3} + \frac{x^3}{9} + C$
D) $7\left(\frac{x^3 \ln 4x}{3} - \frac{x^3}{9}\right) + C$
E) $\frac{x^3 \ln 4x}{3} - \frac{x^3}{9} + C$

8. $\int x \cdot 2^x dx = ?$

A) $2^x\left(\frac{x}{\ln 2} - \frac{1}{\ln^2 2}\right) + C$
B) $2^x\left(\frac{x-1}{\ln 2}\right) + C$
C) $2^x(\ln 2 - \ln^2 2) + C$
D) $2^x(\ln 2 - x) + C$
E) $2^x(\ln^2 2 - \ln 2) + C$

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9. $\int e^x \cdot \sin x dx = ?$

A) $e^x(\sin x - \cos x) + C$

B) $e^x(\sin x + \cos x) + C$

C) $\frac{e^x}{2}(\sin x - \cos x) + C$

D) $\frac{e^x}{2}(\sin x + \cos x) + C$

E) $\frac{e^x}{2}(-\sin x + \cos x) + C$

10. $\int x^2 \cdot \sin x \, dx = ?$

A) $-x^2\cos x - 2x\sin x + 2\cos x + C$

B) $-x^2\cos x + 2x\sin x + 2\cos x + C$

C) $-x^2\cos x + 2x\sin x - 2\cos x + C$

D) $x^2\cos x - 2x\sin x + 2\cos x + C$

E) $x^2\cos x + 2x\sin x - 2\cos x + C$

11. $\int x^3 \cdot \cos x dx = ?$

A) $x^3\sin x + 2x^2\cos x - 6x\sin x - 6\cos x + C$

B) $x^3\sin x - 3x^2\cos x + 6x\sin x + 6\cos x + C$

C) $-x^3\sin x - 3x^2\cos x - 6x\sin x + 6\cos x + C$

D) $x^3\sin x - 3x^2\cos x + 6x\sin x - 6\cos x + C$

E) $x^3\sin x + 3x^2\cos x - 6x\sin x - 6\cos x + C$

12. $\int x \cdot \tan^2 x dx = ?$

A) $x \cdot \tan x + \frac{1}{2}x^2 + \ln|\cos x| + C$

B) $x \cdot \tan x - \frac{1}{2}x^2 - \ln|\cos x| + C$

C) $x \cdot \tan x - \frac{1}{2}x^2 + \ln|\cos x| + C$

D) $x \cdot \tan x + \frac{1}{2}x^2 - \ln|\sin x| + C$

E) $x \cdot \tan x - \frac{1}{2}x^2 - \ln|\sin x| + C$

13. $\int \arctan x \, dx = ?$

A) $x \cdot \arctan x - \ln|x^2 + 1| + C$

B) $x \cdot \arctan x + \ln|x^2 + 1| + C$

C) $x \cdot \arctan x - \frac{1}{2}\ln|x^2 + 1| + C$

D) $x \cdot \arctan x + \frac{1}{2}\ln|x^2 + 1| + C$

E) $\arctan x - \ln|x^2 + 1| + C$

14. $\int \log_2 x \, dx = ?$

A) $\log_2 x - x \cdot \log_2 e + C$

B) $x \cdot (\log_2 x - \log_2 e) + C$

C) $x \cdot \log_2 x - \log_2 e + C$

D) $\frac{x^2}{2} \cdot \log_2 x + \log_2 e + C$

E) $\frac{x^2}{2} \cdot \log_2 x - \log_2 e + C$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7
A	B	E	A	D	B	D
8	**9**	**10**	**11**	**12**	**13**	**14**
A	C	B	E	C	C	B

BÖLÜM CHAPTER 16

TARİHSEL NOT / HISTORICAL NOTE

AUGUSTİN LOUIS CAUCHY [1789 - 1857]

Fransız matematikçi. Analizin temellerine kesinlik kazandıran çalışmaları, karmaşık değişkenli fonksiyonlar teorisine katkılarıyla tanınır. 27 yaşına geldiğinde Cauchy çağının en önde gelen matematikçilerinden biri sayılıyordu.1814'te belirli integrallere ilişkin teoremlerini yayımladı. Kendi adıyla anılan ünlü integral kuramını ortaya attı.

French mathematician. His work, which gives certainty to the fundamentals of analysis, is known for his contributions to the theory of functions of complex variables. At the age of 27, Cauchy was considered to be one of the leading mathematicians of his time. In 1814, he published his theorems on specific integrals. He also introduced the famous integral theory referred to in his name.

BELİRLİ İNTEGRAL
DEFINITE INTEGRAL

Bu bölüm 64 alıştırma sorusu, 74 test sorusu içermektedir.
This chapter includes 64 exercise questions and 74 test questions.

BÖLÜM / CHAPTER 16

BELİRLİ İNTEGRAL / DEFINITE INTEGRAL

- Belirli İntegral / Definite Integral .... 435 – 452

BÖLÜM 16 CHAPTER

BELİRLİ İNTEGRAL
DEFINITE INTEGRAL

1. $\int_{3}^{4} x\,dx = ?$

Yanıt / The Answer is $\frac{7}{2}$

2. $\int_{-1}^{2} x^2\,dx = ?$

Yanıt / The Answer is 3

3. $\int_{-2}^{3} 3x^2\,dx = ?$

Yanıt / The Answer is 35

4. $\int_{-1}^{4} \frac{x^2}{2}\,dx = ?$

Yanıt / The Answer is $\frac{65}{6}$

5. $\int_{0}^{2} (2x-1)\,dx = ?$

Yanıt / The Answer is 2

6. $\int_{1}^{\sqrt{3}} \frac{dx}{1+x^2} = ?$

Yanıt / The Answer is $\frac{\pi}{12}$

7. $\int_{e^{\frac{1}{2}}}^{e} \frac{1}{x}\,dx = ?$

Yanıt / The Answer is $\frac{1}{2}$

8. $\int_{\frac{\pi}{2}}^{\pi} 2 \cdot \sin x\,dx = ?$

Yanıt / The Answer is 2

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9. $\int_{e}^{e^2} \frac{3}{x} dx = ?$

Yanıt / The Answer is 3

10. $\int_{0}^{\frac{\sqrt{2}}{2}} \frac{dx}{\sqrt{1-x^2}} = ?$

Yanıt / The Answer is $\frac{\pi}{4}$

11. $\int_{0}^{\pi} 4 \cdot \sin x dx = ?$

Yanıt / The Answer is 8

12. $\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} (1+\tan^2 x) dx = ?$

Yanıt / The Answer is -2

13. $\int_{\ln 4}^{\ln 7} e^x dx = ?$

Yanıt / The Answer is 3

14. $\int_{\frac{\pi}{6}}^{\frac{7\pi}{6}} 5 \cdot \cos x dx = ?$

Yanıt / The Answer is -5

15. $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{dx}{\sin^2 x} = ?$

Yanıt / The Answer is $\frac{2\sqrt{3}}{3}$

16. $\int_{0}^{\pi/4} \sec^2 x dx = ?$

Yanıt / The Answer is 1

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17. $\int_0^1 e^{2x} \cdot 2dx = ?$

Yanıt / The Answer is $e^2 - 1$

18. $\int_0^1 x \cdot e^x dx = ?$

Yanıt / The Answer is 1

19. $\int_0^1 (6x - m)dx = 1 \Rightarrow m = ?$

Yanıt / The Answer is 2

20. $\int_1^a (2ax + 1)dx = 7 \Rightarrow a = ?$

Yanıt / The Answer is 2

21. $\int_m^n (2x - 1)dx = 24$

$n - m = 3 \Rightarrow m = ?$

Yanıt / The Answer is 3

22. $\int_0^1 (x^2 + m) = \frac{13}{3} \Rightarrow m = ?$

Yanıt / The Answer is 4

23. $\int_{-2}^0 (2x + a) = -2 \Rightarrow a = ?$

Yanıt / The Answer is 1

24. $\int_0^2 (3x^2 + mx)dx = 12 \Rightarrow m = ?$

Yanıt / The Answer is 2

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25. $\int_a^b \frac{2x}{b-a}dx = 12 \Rightarrow a+b=?$

Yanıt / The Answer is 12

29. $\int_0^{\pi} d(\cos x) = ?$

Yanıt / The Answer is −2

26. $\int_0^3 d(x^2-2x) = ?$

Yanıt / The Answer is 3

30. $\int_0^{\pi/6} (2\cdot\cos^2 x-1)dx = ?$

Yanıt / The Answer is $\frac{\sqrt{3}}{4}$

27. $\int_1^2 d(2x^3-3x^2+1) = ?$

Yanıt / The Answer is 5

31. $\frac{d}{dx}\int_2^5 (3x^2-4x+2)dx = ?$

Yanıt / The Answer is 0

28. $f(x)=2x-3$

$\Rightarrow \int_2^3 d(f^{-1}(x)) = ?$

Yanıt / The Answer is $\frac{1}{2}$

32. $\frac{d}{dx}\int_3^7 (x^3+2x^2-5)dx = ?$

Yanıt / The Answer is 0

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33. $\displaystyle\int_0^1 (x-1)^4 dx = ?$

Yanıt / The Answer is $\frac{1}{5}$

34. $\displaystyle\int_0^1 (2x+1)^3 dx = ?$

Yanıt / The Answer is 10

35. $\displaystyle\int_0^2 (x^2+2x-1)\cdot(x+1)dx = ?$

Yanıt / The Answer is 12

36. $\displaystyle\int_1^4 (2+\sqrt{x})dx = ?$

Yanıt / The Answer is $\frac{32}{3}$

37. $\displaystyle\int_0^5 \sqrt{3x+1}\,dx = ?$

Yanıt / The Answer is 14

38. $\displaystyle\int_0^4 \frac{dx}{\sqrt{4-x}} = ?$

Yanıt / The Answer is 4

39. $\displaystyle\int_0^3 \frac{xdx}{\sqrt{x^2+16}} = ?$

Yanıt / The Answer is 1

40. $\displaystyle\int_0^{\pi/4} \tan^2 x\cdot\sec^2 x dx = ?$

Yanıt / The Answer is $\frac{1}{3}$

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41. $\int_{1}^{4} (2x - \sin^2 x - \cos^2 x)dx = ?$

Yanıt / The Answer is 12

42. $\int_{0}^{\pi/4} (\sin^2 x - \cos^2 x)dx = ?$

Yanıt / The Answer is $-\frac{1}{2}$

43. $\int_{3}^{4} 2^{x-3}dx = ?$

Yanıt / The Answer is $\frac{1}{\ln 2}$

44. $\int_{0}^{1} 2x \cdot e^x dx = ?$

Yanıt / The Answer is 2

45. $F(x) = \int_{4}^{5x} e^{t^2} dt \Rightarrow F'(0) = ?$

Yanıt / The Answer is 5

46. $F(x) = \int_{3}^{\ln x} e^t dt \Rightarrow F'(3) = ?$

Yanıt / The Answer is 1

47. $F(x) = \int_{3x}^{x^2} \ln t \cdot dt \Rightarrow F'(e) = ?$

Yanıt / The Answer is $4e - 3 \cdot \ln 3e$

48. $F(x) = \int_{\frac{\pi}{3}}^{x} \sin 2t dt \Rightarrow F'(\pi) = ?$

Yanıt / The Answer is 0

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49. $F(x) = \int_{x}^{x^2} \sqrt{t^2 + 3t}\,dt \Rightarrow F'(1) = ?$

Yanıt / The Answer is 2

50. $F(x) = \int_{2x}^{x^2} \sqrt{t^2 + 2t}\,dt \Rightarrow F'(2) = ?$

Yanıt / The Answer is $4\sqrt{6}$

51. $f(x) = \begin{cases} 2x + 1, & x > 0 \\ 4x - 1, & x \le 0 \end{cases}$

$\Rightarrow \int_{-1}^{1} f(x)dx = ?$

Yanıt / The Answer is −1

52. $f(x) = \begin{cases} 3, & x \ge 1 \\ 6x, & x < 1 \end{cases}$

$\Rightarrow \int_{-1}^{2} f(x)dx = ?$

Yanıt / The Answer is 3

53. $f(x) = \begin{cases} 3x^2 + 1, & x > 0 \\ 2x - 3, & 0 \le x \end{cases}$

$\Rightarrow \int_{-1}^{3} f(x)dx = ?$

Yanıt / The Answer is 26

54. $f(x) = \begin{cases} 4x^3, & x > 1 \\ 3x^2, & x \le 1 \end{cases}$

$\Rightarrow \int_{0}^{2} f(x)dx = ?$

Yanıt / The Answer is 16

55. $\int_{-2}^{2} |x - 1|dx = ?$

Yanıt / The Answer is 5

56. $\int_{1}^{2} |x - 3|dx = ?$

Yanıt / The Answer is $\frac{3}{2}$

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57. $\int_{1}^{4} |x-2|\,dx = ?$

Yanıt / The Answer is $\frac{5}{2}$

58. $\int_{\frac{2\pi}{3}}^{\frac{4\pi}{3}} |\sin x|\,dx = ?$

Yanıt / The Answer is 1

59. $\int_{0}^{6} |x-4|\,dx = ?$

Yanıt / The Answer is 10

60. $\int_{-3}^{3} |x|\,dx = ?$

Yanıt / The Answer is 9

61. $\int_{1}^{e} \ln x\,dx = ?$

Yanıt / The Answer is 1

62. $\int_{0}^{1} x^2 \cdot e^x\,dx = ?$

Yanıt / The Answer is $e-2$

63. $\int_{0}^{\pi/2} x \cdot \sin x\,dx = ?$

Yanıt / The Answer is 1

64. $\int_{0}^{\pi/2} \frac{\sin 2x}{3+\sin^2 x}\,dx = ?$

Yanıt / The Answer is $\ln\frac{4}{3}$

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1. $\int_{-1}^{4} 3\,dx = ?$

A) –15 B) –10 C) 8 D) 10 E) 15

2. $\int_{-1}^{3} 6x^2\,dx = ?$

A) 56 B) 54 C) 52 D) 50 E) 48

3. $\int_{0}^{2} (4-x^2)\,dx = ?$

A) $\frac{16}{3}$ B) $-\frac{16}{3}$ C) 1 D) $-\frac{8}{3}$ E) $\frac{8}{3}$

4. $\int_{-2}^{1} x^3\,dx = ?$

A) $-\frac{14}{3}$ B) $-\frac{16}{3}$ C) $-\frac{15}{4}$ D) $\frac{16}{5}$ E) $\frac{15}{4}$

5. $\int_{1}^{2} (3x^2-2x+1)\,dx = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

6. $\int_{-1}^{3} (3x^2-x+6)\,dx = ?$

A) 36 B) 42 C) 48 D) 52 E) 61

7. $\int_{0}^{3} (x-3)^2\,dx = ?$

A) 1 B) 3 C) 5 D) 7 E) 9

8. $\int_{-3}^{2} (x+3)^4\,dx = ?$

A) 25 B) 75 C) 125 D) 225 E) 625

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9. $\int_0^2 (t^2+t)\,dt = ?$

A) $\frac{11}{3}$ B) $\frac{13}{3}$ C) $\frac{14}{3}$ D) $\frac{16}{3}$ E) $\frac{17}{3}$

10. $\int_2^4 \frac{1}{x}dx = ?$

A) 1 B) 2 C) ln2 D) ln3 E) ln4

11. $\int_{-1}^2 d(x^3-2x) = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

12. $\int_e^{e^5} d(\ln x) = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

13. $\int_0^1 e^{3x}dx = ?$

A) $\frac{e^3}{3}$ B) e^3 C) $-e^3$ D) e^3-1 E) $\frac{e^3-1}{3}$

14. $\int_1^3 2^x dx = ?$

A) $\frac{8}{\ln 2}$ B) $\frac{6}{\ln 2}$ C) $\frac{4}{\ln 2}$ D) $\frac{2}{\ln 2}$ E) $\frac{1}{\ln 2}$

15. $\int_2^m \frac{1}{x}dx = \ln 2 \Rightarrow m = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

16. $\int_1^8 \frac{4}{y}dy = ?$

A) $3\cdot\ln 2$ B) $6\cdot\ln 2$ C) $9\cdot\ln 2$ D) $12\cdot\ln 2$ E) $15\cdot\ln 2$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	A	A	C	E	C	E	E
9	10	11	12	13	14	15	16
C	C	A	C	E	B	D	D

1. $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \sin x \, dx = ?$

A) $\frac{-1+\sqrt{3}}{2}$ B) $\frac{-1-\sqrt{3}}{2}$ C) $\frac{1-\sqrt{3}}{2}$ D) $\frac{\sqrt{3}-1}{4}$ E) $\frac{\sqrt{3}+1}{2}$

2. $\int_{0}^{\frac{2\pi}{3}} d(\cos x) = ?$

A) $-\frac{3}{2}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) 1 E) $\frac{3}{2}$

3. $\int_{0}^{\frac{\pi}{2}} (\cos x - \sin x)dx = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

4. $\int_{0}^{\pi} \sin\left(\frac{x}{2}\right)dx = ?$

A) 2 B) $\frac{3}{2}$ C) 1 D) $-\frac{1}{2}$ E) –3

5. $\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \sec^2 x \, dx = ?$

A) $-\sqrt{3}$ B) $-\sqrt{3}-1$ C) $-\sqrt{3}+1$ D) $\sqrt{3}$ E) $\sqrt{3}-1$

6. $\int_{0}^{\frac{\pi}{4}} (\tan^2 x + 3)dx = ?$

A) $\frac{\pi-1}{2}$ B) $\frac{\pi-2}{2}$ C) $\frac{\pi-2}{4}$ D) $\frac{\pi+2}{2}$ E) $\frac{\pi+2}{4}$

7. $\int_{0}^{\frac{\pi}{4}} \tan^2 x dx = ?$

A) 0 B) $\frac{\pi}{4}$ C) $1-\frac{\pi}{4}$ D) $\frac{\pi}{2}$ E) $\frac{3\pi}{5}$

8. $\int_{0}^{\frac{\pi}{3}} \frac{\sin x}{\cos^2 x} dx = ?$

A) 2 B) 1 C) 0 D) –1 E) –2

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9. $\int_0^{\frac{\pi}{2}} \cos^3 x \cdot \sin x \, dx = ?$

A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

10. $\int_{\frac{\pi}{2}}^{\frac{3\pi}{2}} \sin^3 x \cdot \cos x dx = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) $\frac{\sqrt{3}}{2}$

11. $\int_0^{\pi/4} e^{\tan x} \cdot \sec^2 x dx = ?$

A) –2e B) –e C) e D) e–1 E) 2e

12. $\int_{\frac{1}{\sqrt{3}}}^{1} \frac{1}{1+x^2} dx = ?$

A) $\frac{\pi}{18}$ B) $\frac{\pi}{16}$ C) $\frac{\pi}{14}$ D) $\frac{\pi}{12}$ E) $\frac{\pi}{8}$

13. $\int_0^{\frac{\sqrt{2}}{4}} \frac{1}{\sqrt{1-4x^2}} dx = ?$

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{8}$ E) $\frac{\pi}{16}$

14. $\int_0^{\frac{1}{3}} \frac{dx}{\sqrt{4-9x^2}} = ?$

A) $\frac{\pi}{18}$ B) $\frac{\pi}{12}$ C) $\frac{\pi}{9}$ D) $\frac{\pi}{6}$ E) $\frac{\pi}{3}$

15. $\int_0^{\frac{\pi}{12}} \cos^2 x \, dx - \int_0^{\frac{\pi}{12}} \sin^2 x \, dx = ?$

A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

16. $\int_0^{\frac{\pi}{3}} \sqrt{1-\cos 2x} \, dx = ?$

A) $-\frac{\sqrt{6}}{2}$ B) $\frac{\sqrt{2}}{2}$ C) 1 D) $\sqrt{2}$ E) $\sqrt{6}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	A	C	A	E	D	C	B
9	10	11	12	13	14	15	16
C	C	D	D	D	A	C	B

1. $\int_{4}^{9} \frac{1}{\sqrt{x}} dx = ?$

A) 6 B) 4 C) 2 D) 1 E) 0

2. $\int_{-4}^{3} x \cdot d(3x^2 + 5) = ?$

A) 182 B) 183 C) 128 D) –183 E) –182

3. $\int_{1}^{e} \frac{\ln x}{x} dx = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

4. $\int_{e}^{e^3} \frac{\ln x}{x} dx = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

5. $\int_{e}^{e^4} \frac{dx}{x \cdot \ln x} = ?$

A) ln4 B) ln2 C) 0 D) 1 E) 2

6. $\int_{-1905}^{1905} (x^5 + 3x^3 + 3) = ?$

A) –11430 B) –10120 C) 0 D) 10120 E) 11430

7. $\int_{-3}^{3} (4x^3 - 3x) dx = ?$

A) –175 B) –162 C) 0 D) 162 E) 175

8. $f^{-1}(x) = \frac{x-1}{2} \Rightarrow \int_{-1}^{1} f(x) dx = ?$

A) 4 B) 3 C) 2 D) 1 E) 0

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9. $\int f(x)dx = x^2 + 3x + C \Rightarrow \int_1^2 f(x)dx = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

10. $\int_a^b (2x+1)dx = b - a,\ \ a \neq b \Rightarrow a + b = ?$

A) –2 B) 0 C) 1 D) 2 E) 3

11. $\int_a^b (4x-7)dx = 45,\ b - a = 5 \Rightarrow a + b = ?$

A) 2 B) 4 C) 6 D) 8 E) 12

12. $\int_1^e \frac{x-1}{x^2}dx = ?$

A) –1 B) $-\frac{1}{e}$ C) 0 D) $\frac{1}{e}$ E) 1

13. $\int_0^1 \frac{x^2}{x+1}dx = ?$

A) $-\frac{1}{2} + \ln 2$ B) $-1 + \ln 2$ C) $\ln 2$ D) ln4 E) 1+2ln2

14. $\int_4^9 \frac{3x-3}{\sqrt{x}+1}dx = ?$

A) 13 B) 18 C) 23 D) 28 E) 33

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YANITLAR / ANSWERS

1	2	3	4	5	6	7
C	A	B	B	A	E	C
8	9	10	11	12	13	14
C	D	B	D	D	A	C

1. $f(x)=\int_{\ln 2}^{\ln 4} e^{2t}dt \Rightarrow f'(x)=?$

A) ln2 B) e^{2x} C) 0 D) 2x E) 1

2. $f(x)=\int_{0}^{\ln x} e^{t}dt \Rightarrow f'(x)=?$

A) x B) e^{x} C) lnx D) 0 E) 1

3. $f(x)=\int_{x}^{x^3} (2t^2-3)dt \Rightarrow f'(1)=?$

A) –4 B) –3 C) –2 D) –1 E) 0

4. $f(x)=\int_{0}^{\sin x} e^{t}dt \Rightarrow f'\left(\frac{\pi}{2}\right)=?$

A) 0 B) e C) e – 1 D) e + 1 E) 1 – e

5. $f(x)=\int_{-1}^{\ln x} \sqrt{6+3t^2}\,dt \Rightarrow f'(e)=?$

A) 3e B) 2e C) $\frac{3}{e}$ D) $\frac{2}{e}$ E) $\frac{1}{e}$

6. $\int_{2}^{3} \sum_{n=1}^{x} (6n-5)dx=?$

A) 12 B) 14 C) 18 D) 24 E) 28

7. $\int_{-1}^{1} |x|\,dx=?$

A) 0 B) 1 C) $\frac{1}{2}$ D) 1+log2 E) 2

8. $\int_{-1}^{2} |x|\,dx=?$

A) 1 B) $\frac{3}{2}$ C) 0 D) $\frac{5}{2}$ E) 3

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9. $\int_{-1}^{3} |x+2|\,dx = ?$

A) 4 B) 6 C) 8 D) 10 E) 12

10. $\int_{2}^{3} |2x-6|\,dx = ?$

A) –2 B) –1 C) 1 D) 2 E) 3

11. $\int_{-3}^{2} |x-1|\,dx = ?$

A) $\frac{15}{2}$ B) $-\frac{13}{2}$ C) $-\frac{17}{2}$ D) $\frac{17}{2}$ E) $\frac{13}{2}$

12. $\int_{-1}^{3} |x-2|\,dx = ?$

A) 3 B) 4 C) 5 D) 6 E) 8

13. $\int_{-1}^{4} |x-3|\,dx = ?$

A) $\frac{13}{2}$ B) $\frac{15}{2}$ C) $\frac{17}{2}$ D) $\frac{19}{2}$ E) $\frac{21}{2}$

14. $\int_{-1}^{2} |x|\cdot 3x\,dx = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

YANITLAR / ANSWERS

1	2	3	4	5	6	7
C	E	C	A	C	B	B
8	9	10	11	12	13	14
D	E	C	D	C	C	C

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1. $f(x)=\begin{cases}3x^2+1, & x\geq 1\\ 2x-3, & x<1\end{cases} \Rightarrow \int_0^3 f(x)dx = ?$

A) 24 B) 26 C) 28 D) 30 E) 32

2. $f(x)=\begin{cases}3x^2+1, & x\geq 2\\ 2x+3, & x<2\end{cases} \Rightarrow \int_{-1}^4 f(x)dx = ?$

A) 48 B) 54 C) 58 D) 64 E) 70

3. $f(x)=\begin{cases}x+3, & 0\leq x<2\\ 3x+3, & 2\leq x<3\end{cases} \Rightarrow \int_0^3 f(x)dx = ?$

A) 24 B) 28 C) 30 D) $\frac{35}{2}$ E) $\frac{37}{2}$

4. $f:(-1,1)\to R$,

$f(x)=\begin{cases}x+1, & -1<x<0\\ x^2+2, & 0<x<1\end{cases} \Rightarrow \int_{-1}^1 f(x)dx = ?$

A) 13 B) 6 C) $\frac{11}{4}$ D) $\frac{13}{6}$ E) $\frac{17}{6}$

5. $f(x)=\begin{cases}x^{-1}, & x<e\\ x, & x\geq e\end{cases} \Rightarrow \int_1^3 f(x)dx = ?$

A) $\ln 3$ B) $\ln 3+\frac{9}{2}$ C) $\frac{1}{2}-e$ D) $\frac{11-e^2}{2}$ E) $\frac{e^2-3}{2}$

6. $\int_0^{\frac{\pi}{6}} 2\tan 2x dx = ?$

A) ln2 B) ln3 C) ln4 D) ln5 E) ln6

7. $\int_0^{\pi} x\cdot \sin x \, dx = ?$

A) $-\pi$ B) -2 C) -1 D) 0 E) π

8. $\int_1^e \ln x \, dx = ?$

A) –2 B) –1 C) 1 D) 2 E) 3

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9. $\displaystyle\int_{1}^{e} \ln^2 x \cdot dx = ?$

A) e B) e – 1 C) e – 2 D) $e^2 - 1$ E) $e^2 - 2$

10. $\displaystyle\int_{1}^{\ln 3} x \cdot e^x dx = ?$

A) 3ln3 B) – 3ln3 C) – 3 + ln27 D) – 3 E) ln27 + 3

11. $\displaystyle\int_{0}^{1} (x+1) \cdot e^x dx = ?$

A) e B) e – 1 C) e – 2 D) 2e E) 3e

12. $\displaystyle\int_{0}^{3} e^x \cdot x^2\, dx = ?$

A) $5e^3 - 2$ B) $3e^3$ C) $2e^3 + 1$ D) $e^3 + 1$ E) $e^3 - 3$

13. $\displaystyle\int_{0}^{\frac{\pi}{2}} e^{\sin x} \cdot \sin 2x dx = ?$

A) –3 B) –2 C) 0 D) 2 E) 3

14. $\displaystyle\int_{\frac{1}{2}}^{\frac{e}{2}} x \cdot \ln(2x) dx = ?$

A) e^2 B) $e^2 - 1$ C) $e^2 + 1$ D) $\dfrac{e^2+1}{4}$ E) $\dfrac{e^2+1}{16}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7
B	E	E	E	D	A	E
8	9	10	11	12	13	14
C	C	C	A	A	D	E

BÖLÜM CHAPTER 17

TARİHSEL NOT / HISTORICAL NOTE

GEORG FRİEDRİCH BERNHARD RİEMANN [1826 – 1866]

Alman matematikçi. Analiz, sayı teorisi ve diferansiyel geometriye katkıda bulunan, gerçek analiz alanında, integrallerin ilk titiz formülasyonu, Riemann integrali ve Fourier serileri üzerine çalışmaları bilinir. Riemann hipotezinin orijinal ifadesini içeren asal sayma işleviyle ilgili ünlü 1859 tarihli makalesi, analitik sayı teorisindeki en etkili makalelerden biri olarak kabul edilmektedir. Geometriye öncülük eden katkılarıyla Riemann, genel göreliliğin matematiğinin temellerini attı.

German mathematician. He is known for his works in the fields of real analysis, which contributes to analysis, number theory and differential geometry, the first rigorous formulation of integrals, Riemann integral and Fourier series are. His famous 1859 paper on prime counting, which includes the original expression of the Riemann hypothesis, is considered one of the most effective papers in analytic number theory. With his contributions leading to geometry, Riemann laid the foundations of mathematics of general relativity.

İNTEGRAL UYGULAMALARI
APPLICATIONS of INTEGRAL

Bu bölüm 26 alıştırma sorusu, 60 test sorusu, 14 YÖS sorusu içermektedir.

This chapter includes 26 exercise questions, 60 test questions, and 14 YÖS questions.

BÖLÜM / CHAPTER 17

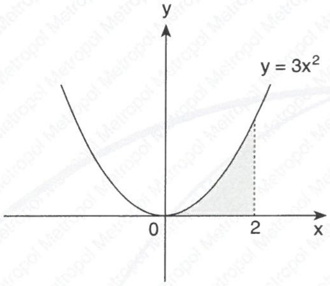
İNTEGRAL UYGULAMALARI / APPLICATIONS of INTEGRAL

- İntegral Uygulamaları / Applications of Integral .... 455 – 470

BÖLÜM 17 CHAPTER

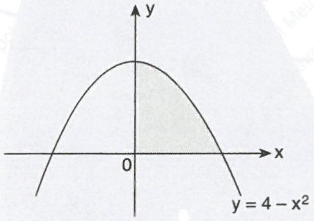
İNTEGRAL UYGULAMALARI
APPLICATIONS of INTEGRAL

1. TA/SA = ? $br^2(u^2)$



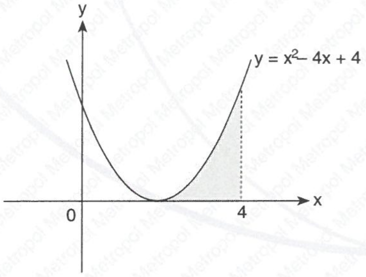
Yanıt / The Answer is 8

2. TA/SA = ? $br^2(u^2)$



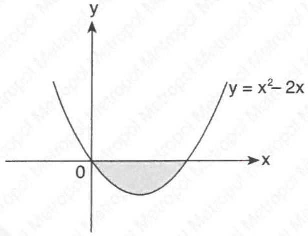
Yanıt / The Answer is $\frac{16}{3}$

3. TA/SA = ? $br^2(u^2)$



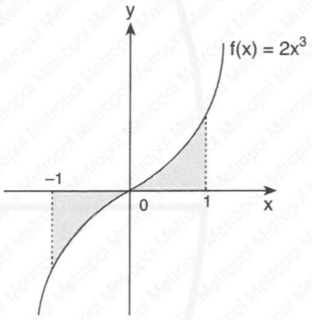
Yanıt / The Answer is $\frac{8}{3}$

4. TA/SA = ? $br^2(u^2)$



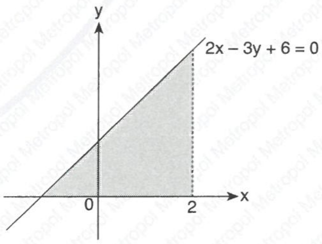
Yanıt / The Answer is $\frac{4}{3}$

5. TA/SA = ? $br^2(u^2)$



Yanıt / The Answer is 1

6. TA/SA = ? $br^2(u^2)$



Yanıt / The Answer is $\frac{25}{3}$

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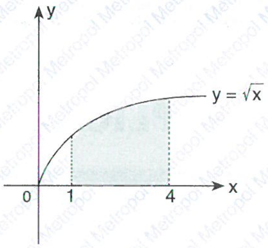
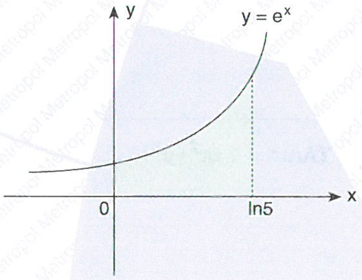
7. TA/SA = ? br^2 (u^2)



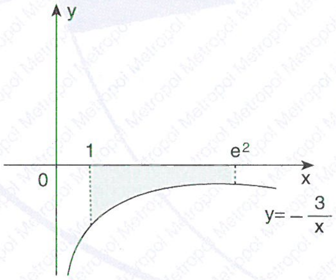
Yanıt / **The Answer is** $\frac{14}{3}$

8. TA/SA = ? br^2 (u^2)



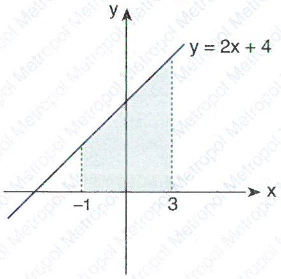
Yanıt / **The Answer is** **4**

9. TA/SA = ? br^2 (u^2)



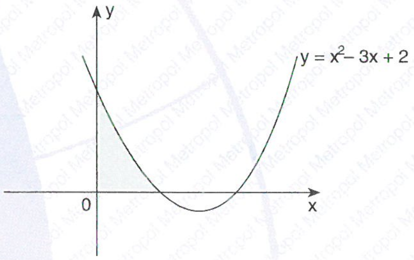
Yanıt / **The Answer is** **6**

10. TA/SA = ? br^2 (u^2)



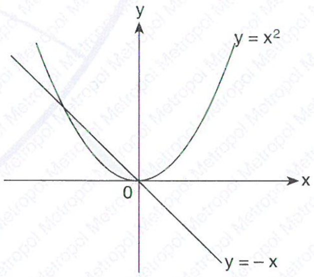
Yanıt / **The Answer is** **24**

11. TA/SA = ? br^2 (u^2)



Yanıt / **The Answer is** $\frac{5}{6}$

12. TA/SA = ? br^2 (u^2)



Yanıt / **The Answer is** $\frac{1}{6}$

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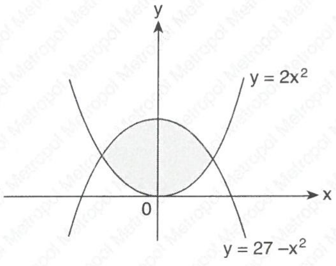
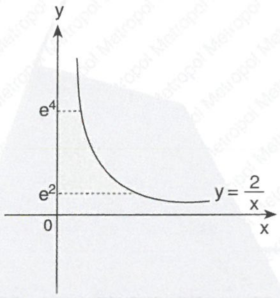
13. **TA/SA = ? $br^2(u^2)$**



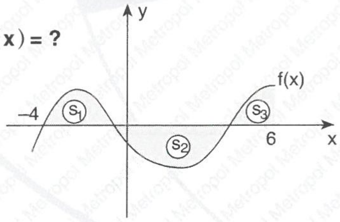
Yanıt / The Answer is **108**

14. **TA/SA = ? $br^2(u^2)$**



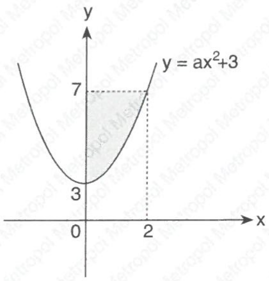
Yanıt / The Answer is **4**

15. $\left.\begin{aligned} S_1 &= 7\,br^2(u^2) \\ S_2 &= 13\,br^2(u^2) \\ S_3 &= 8\,br^2(u^2) \end{aligned}\right\} \Rightarrow \displaystyle\int_{-4}^{6} f(x) = ?$



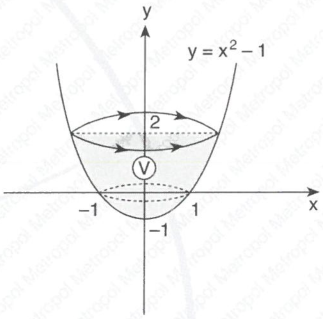
Yanıt / The Answer is **2**

16. **TA/SA = ? $br^2(u^2)$**



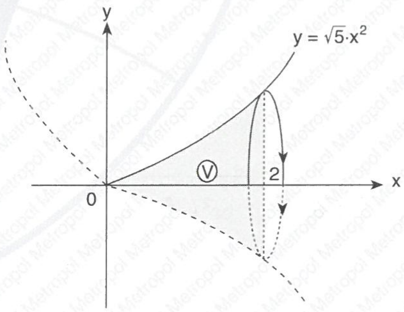
Yanıt / The Answer is $\mathbf{\frac{16}{3}}$

17. **V = ? $br^3(u^3)$**



Yanıt / The Answer is $\mathbf{\frac{9\pi}{2}}$

18. **V = ? $br^3(u^3)$**



Yanıt / The Answer is **32π**

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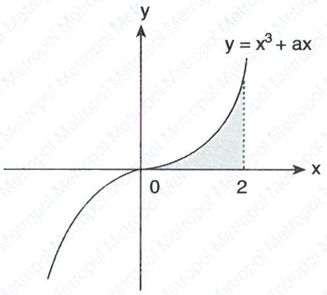
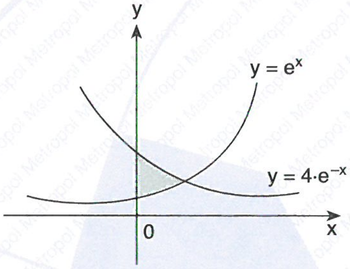
19. TA/SA = 8 $br^2(u^2)$

$\Rightarrow$ a = ?



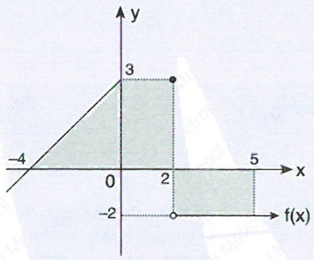
Yanıt / The Answer is 2

20. TA/SA = ? $br^2(u^2)$



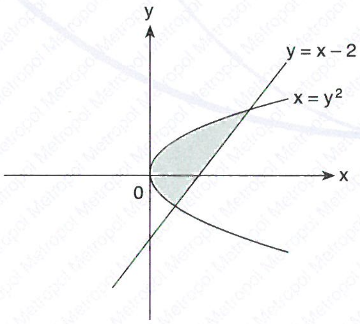
Yanıt / The Answer is 1

21. $\int_{-4}^{5} f(x)dx = ?$



Yanıt / The Answer is 6

22. TA/SA = ? $br^2(u^2)$



Yanıt / The Answer is $\frac{9}{2}$

23. $\int_{-2}^{2} \sqrt{4-x^2}\,dx = ?$

Yanıt / The Answer is 2π

24. $\int_{0}^{4} \sqrt{16-x^2}\,dx = ?$

Yanıt / The Answer is 4π

25. $\int_{0}^{3} \left(\sqrt{9-x^2}+x-3\right)dx = ?$

Yanıt / The Answer is $\frac{9\pi}{4}-\frac{9}{2}$

26. $\int_{0}^{\sqrt{2}} \left(\sqrt{4-x^2}-x\right)dx = ?$

Yanıt / The Answer is $\frac{\pi}{2}$

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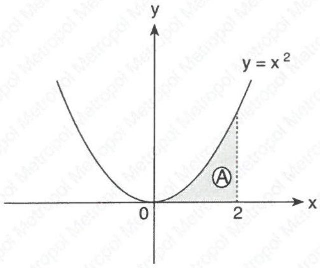
1. Alan (A) =?

Area (A) =?



A) $\frac{2}{3}$

B) $\frac{4}{3}$

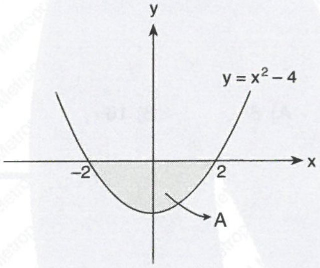
C) 2

D) $\frac{8}{3}$

E) $\frac{10}{3}$

2. Alan (A) =?

Area (A) =?



A) $\frac{8}{3}$

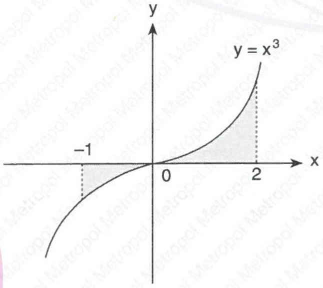
B) 4

C) $\frac{16}{3}$

D) 8

E) $\frac{32}{3}$

3. TA / SA = ?



A) 2

B) $\frac{13}{4}$

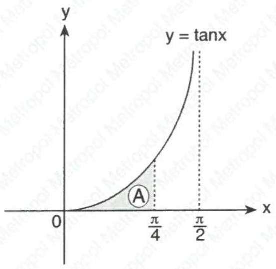
C) $\frac{15}{4}$

D) $\frac{17}{4}$

E) 5

4. Alan(A) =?

Area (A) =?



A) ln2

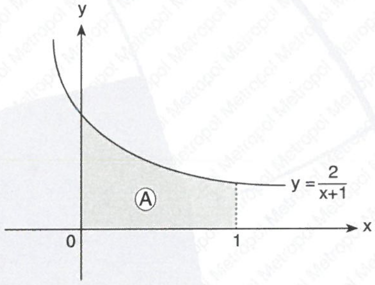
B) ln8

C) ln4

D) $\ln\sqrt{2}$

E) $\ln2\sqrt{2}$

5.



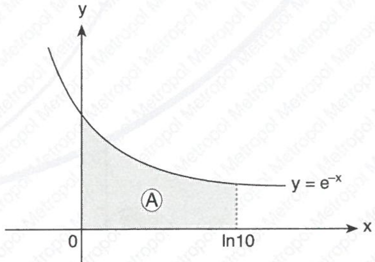
⇒ **Alan (A) =?**

Area (A) =?

A) ln2 B) ln4 C) ln8

D) 2 – ln2 E) 4 – ln2

6.



⇒ **Alan (A) =?**

Area (A) =?

A) 3 B) $\frac{5}{6}$ C) $\frac{7}{10}$ D) $\frac{9}{10}$ E) 11

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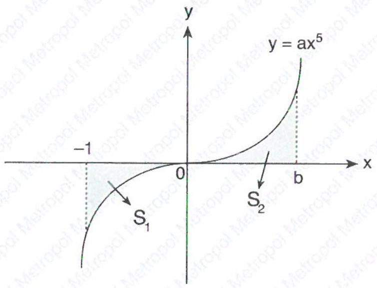
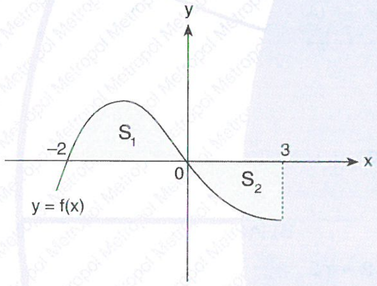
7.



$S_2 = 27 \cdot S_1 \Rightarrow$ **b = ?**

A) 3 B) $\sqrt[4]{3}$ C) $\sqrt[5]{27}$ D) $\sqrt{3}$ E) $\sqrt[3]{9}$

8.



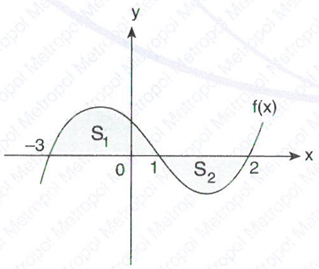
$S_1 = 6$ br ^{2} (u^2), $S_2 = 4$ br ^{2} (u^2) $\Rightarrow \int_{-2}^{3} \mathbf{f(x)dx = ?}$

A) −2 B) 2 C) 4 D) 6 E) 10

9. $S_1 = 25\ br^2(u^2)$,

$S_2 = 4\ br^2(u^2)$

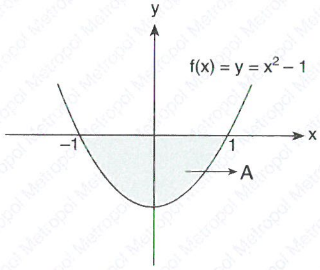
$\Rightarrow \int_{-3}^{2} \mathbf{f(x)dx = ?}$



A) 14 B) 16 C) 21 D) 30 E) 36

10. Alan (A) =?

Area (A) =?



A) $\frac{2}{3}$

B) 1

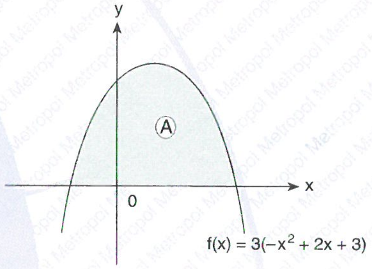
C) $\frac{4}{3}$

D) $\frac{5}{3}$

E) 2

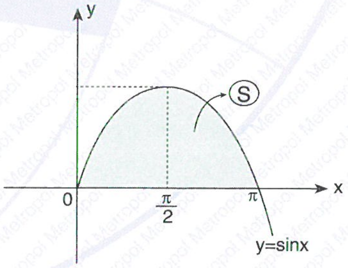
11. Alan (A) =?

Area (A) =?



A) 8 B) 16 C) 20 D) 30 E) 32

12.



$\Rightarrow$ **S = ? br^2(u^2)**

A) 4 B) 2 C) 1 D) 6 E) 8

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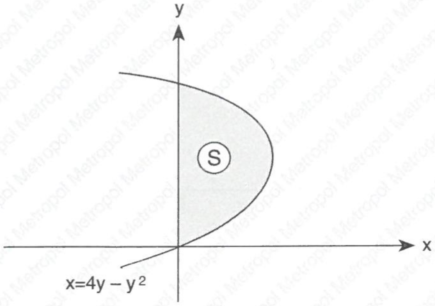
1	2	3	4	5	6	7	8	9	10	11	12
D	E	D	D	B	D	D	B	C	C	E	B

1.



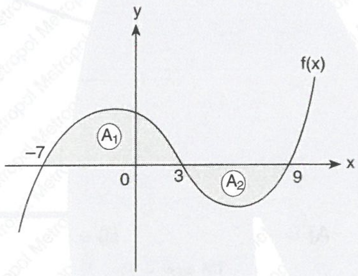
$\Rightarrow$ **S = ? br^2 (u^2)**

A) $\frac{11}{3}$ B) 4 C) $\frac{22}{3}$ D) $\frac{32}{3}$ E) $\frac{64}{3}$

2. $A_1 = 15$ br^2 (u^2),

$A_2 = 6$ br^2 (u^2)

$\Rightarrow \int_{-7}^{9} f(x)dx = ?$

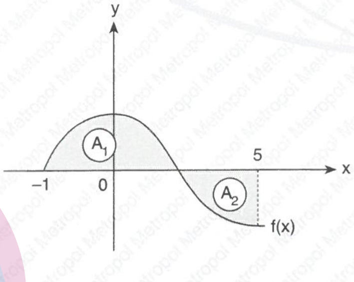


A) 6 B) 9 C) 12 D) 18 E) 21

3. $\int_{-1}^{5} f(x)dx = -6,$

$A_1 = 4$

$\Rightarrow$ **A_2 = ?**



A) 2 B) 4 C) 6 D) 8 E) 10

4. **Alan (A) = ?**

Area (A) =?

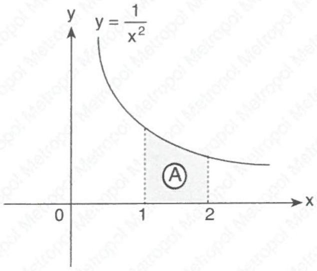
A) $\frac{1}{4}$

B) $\frac{1}{3}$

C) $\frac{1}{2}$

D) $\frac{2}{3}$

E) 1



5. **TA / SA = ?**

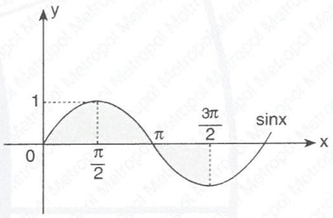
A) 1

B) $\frac{3}{2}$

C) 2

D) $\frac{5}{2}$

E) 3



6. $S = \frac{4}{3}$ br^2 (u^2)

$\Rightarrow$ **m = ?**

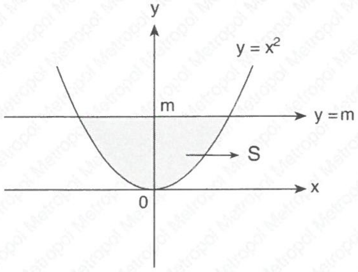
A) 1

B) $\frac{3}{2}$

C) 2

D) $\frac{5}{2}$

E) 3



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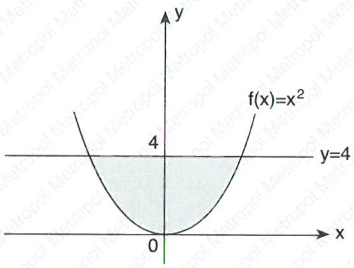
7. **TA / SA = ? cm^2**

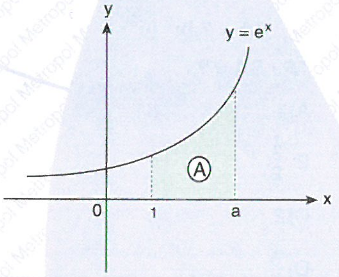


A) 16 B) $\frac{16}{3}$ C) 32 D) $\frac{32}{3}$ E) $\frac{17}{2}$

8. Alan (A)= $e^3 - e$ $br^2(u^2)$

Area (A)= $e^3 - e$ $br^2(u^2)$

⇒ **a = ?**

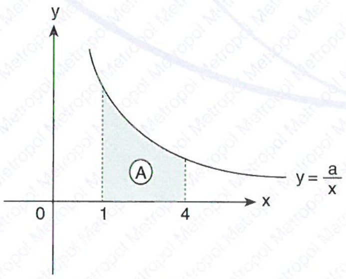


A) $\frac{3}{2}$ B) 2 C) 3 D) 4 E) $\frac{9}{2}$

9. Alan (A)= $2 br^2(u^2)$

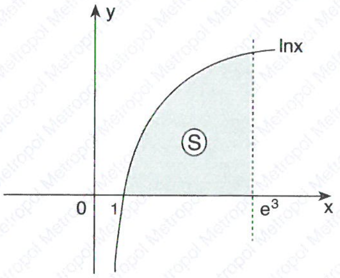
Area (A)= $2 br^2(u^2)$

⇒ **a = ?**



A) $\frac{1}{\ln 2}$ B) $\frac{1}{\ln 4}$ C) ln2 D) ln4 E) $\ln^2 2$

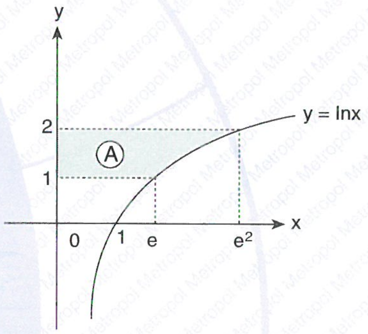
10. **S = ? $br^2(u^2)$**



A) e^3 B) $2e^3$ C) $2e^3 - 1$ D) $2e^3 + 1$ E) $4e^3$

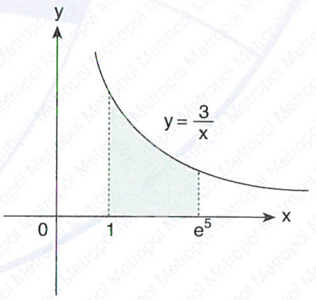
11. **Alan (A) = ?**

Area (A) = ?



A) e – 1 B) e – 2 C) e D) e(e – 1) E) $e^2(e - 1)$

12.



⇒ **TA/SA = ? cm^2**

A) 10 B) 15 C) 20 D) 25 E) 30

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1	2	3	4	5	6	7	8	9	10	11	12
D	B	E	C	E	A	D	C	A	D	D	B

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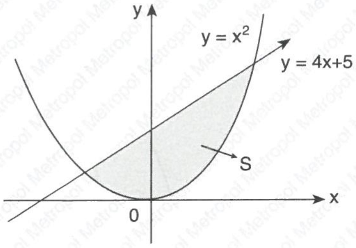
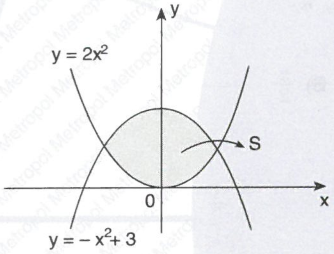
1.



$\Rightarrow$ **S = ? br^2(u^2)**

A) 6 B) 12 C) 18 D) 24 E) 36

2.



$\Rightarrow$ **S = ? br^2(u^2)**

A) 3 B) 4 C) 5 D) 6 E) 8

3. $\Rightarrow$ **S = ? br^2(u^2)**

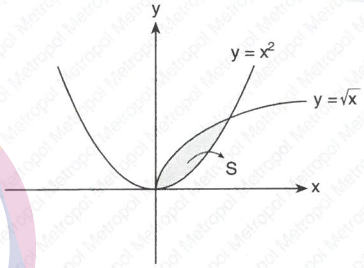
A) $\frac{1}{3}$

B) $\frac{2}{3}$

C) $\frac{3}{4}$

D) $\frac{4}{3}$

E) $\frac{5}{2}$



4. **TA / SA = ? br^2 (u^2)**

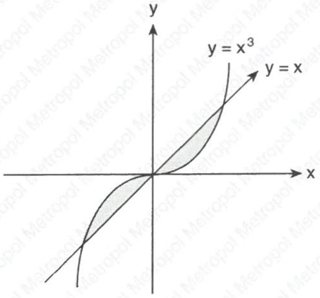
A) $\frac{1}{4}$

B) $\frac{1}{3}$

C) $\frac{1}{2}$

D) $\frac{2}{3}$

E) 1



5. **TA / SA = ? br^2 (u^2)**

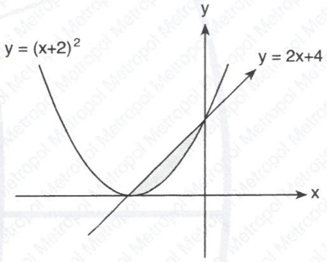
A) $\frac{4}{3}$

B) $\frac{5}{3}$

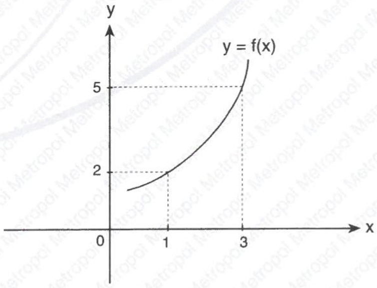
C) $\frac{10}{3}$

D) $\frac{20}{3}$

E) $\frac{40}{3}$



6.



$\Rightarrow \int_1^3 f(x)dx + \int_2^5 f^{-1}(x)dx = ?$

A) 11 B) 12 C) 13 D) 14 E) 15

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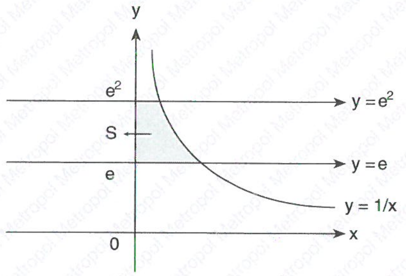
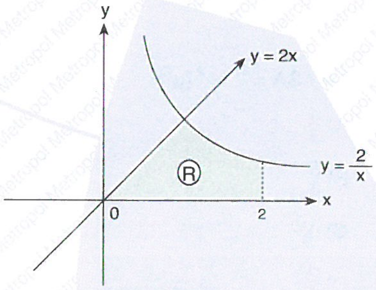
7.



$\Rightarrow$ **S = ? br^2 (u^2)**

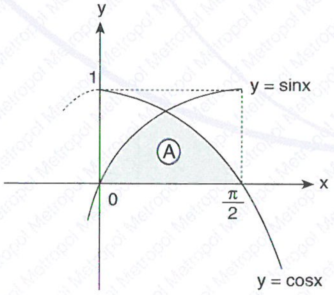
A) $\frac{1}{2}$ B) 1 C) 2 D) ln2 E) ln4

8. **R = ? br^2 (u^2)**



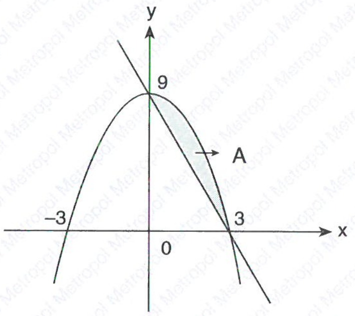
A) 1 + ln2 B) 1 + ln4 C) 2 + ln2
D) 2 + ln4 E) 4 + ln4

9. **A = ? br^2 (u^2)**



A) $2-\sqrt{2}$ B) $4-\sqrt{2}$ C) $2+\sqrt{2}$
D) $4+\sqrt{2}$ E) $2\sqrt{2}$

10. **Alan(A) =? br^2 (u^2)**
Area (A) =? br^2 (u^2)



A) $\frac{5}{2}$ B) $\frac{8}{3}$ C) 3 D) $\frac{7}{2}$ E) $\frac{9}{2}$

11. $\displaystyle\int_0^2 \sqrt{4-x^2}\,dx = ?$

A) $\frac{\pi}{3}$ B) $\frac{\pi}{2}$ C) $\frac{2\pi}{3}$ D) π E) $\frac{3\pi}{2}$

12. $\displaystyle\int_{-3}^{3} \sqrt{9-x^2}\,dx = ?$

A) 3π B) $\frac{7\pi}{2}$ C) 4π D) $\frac{9\pi}{2}$ E) 5π

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
E	B	A	C	A	C	B	B	A	E	D	D

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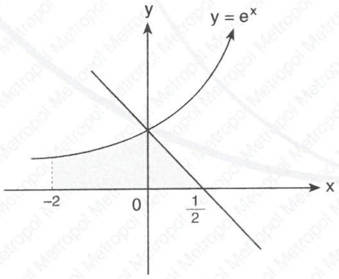
1. $\int_0^2 (\sqrt{4-x^2}+x-2)dx = ?$

A) π B) $\pi - 1$ C) $\pi - 2$ D) $2\pi - 1$ E) $2\pi - 2$

2. $\int_0^{\sqrt{2}} (\sqrt{4-x^2}-x)dx = ?$

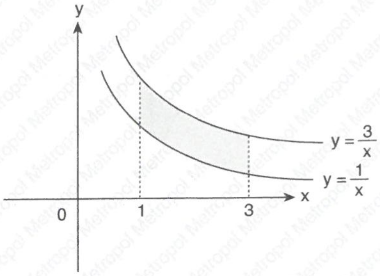
A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{2\pi}{3}$ D) $\frac{3\pi}{4}$ E) π

3. TA / SA = ? br^2 (u^2)



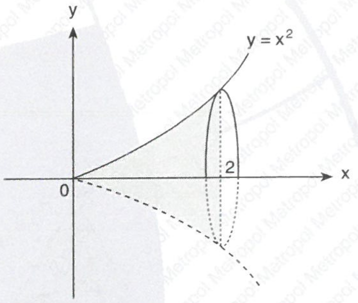
A) $\frac{1}{4}+\frac{1}{e^2}$ B) $\frac{3}{4}-\frac{1}{e^2}$ C) $1+\frac{1}{e^2}$ D) $\frac{3}{4}+\frac{1}{e^2}$ E) $\frac{5}{4}-\frac{1}{e^2}$

4. TA / SA = ? br^2 (u^2)



A) ln3 B) ln4 C) ln6 D) ln8 E) ln9

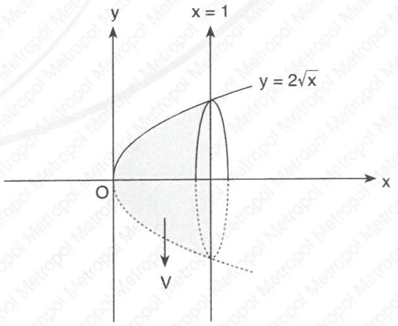
5.



$\Rightarrow$ V = ? π br^3 (u^3)

A) $\frac{32}{5}$ B) 6 C) $\frac{27}{5}$ D) $\frac{26}{5}$ E) 5

6.



$\Rightarrow$ V = ? br^3 (u^3)

A) 2π B) 3π C) 4π D) 6π E) 8π

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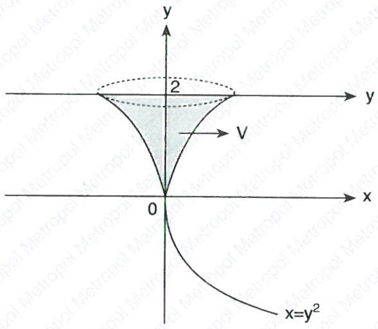
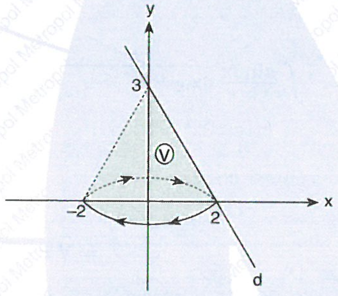
7.



$\Rightarrow$ **V = ? br³ (u³)**

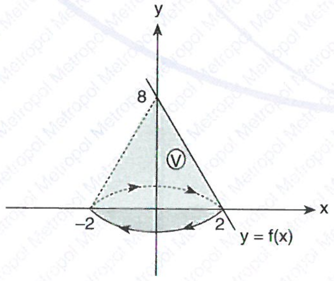
A) $\frac{22\pi}{5}$ B) 2π C) $\frac{28\pi}{5}$ D) 6π E) $\frac{32\pi}{5}$

8. **V = ? br³ (u³)**



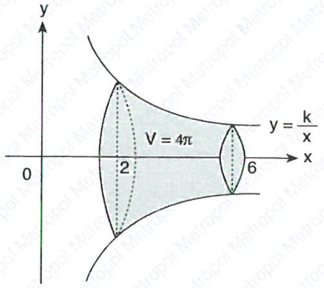
A) π B) 2π C) 3π D) 4π E) 6π

9. **V = ? br³ (u³)**



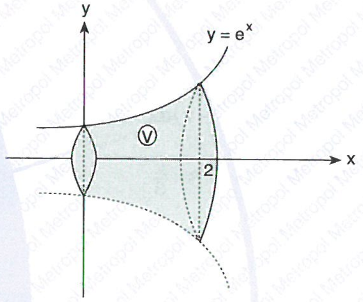
A) $\frac{16\pi}{3}$ B) 6π C) $\frac{32\pi}{3}$ D) $\frac{64\pi}{3}$ E) 24π

10. **k = ?**



A) 1 B) $\sqrt{2}$ C) $\sqrt{3}$ D) 3 E) $2\sqrt{3}$

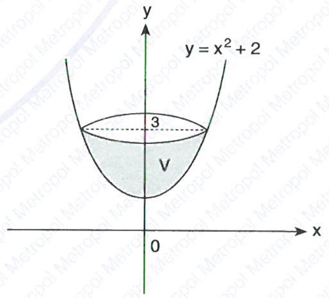
11. **V = ? br³(u³)**



A) $\frac{\pi}{4}(e^4-1)$ B) $\frac{\pi}{4}(e^4+1)$ C) $\frac{\pi}{2}(e^4-1)$
D) $\frac{\pi}{2}(e^4+1)$ E) $\frac{\pi}{2}(e^2-1)$

12. **V = ? br³(u³)**

A) $\frac{\pi}{4}$
B) $\frac{\pi}{3}$
C) $\frac{\pi}{2}$
D) π
E) $\frac{3\pi}{2}$



YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
C	A	E	E	A	A	E	D	C	E	C	C

METROPOL YAYINLARI • METROPOL PUBLICATIONS

1. $f(x)=\begin{cases} 3-x & , \ x<2 \\ 2x-3 & , \ x\geq 2 \end{cases}$

$\Rightarrow \int_1^3 f(x+1)dx = ?$

A) 2 B) 4 C) 6 D) 8 E) 10

2. $\int \frac{dx}{\sin 2x} = ?$

A) $\frac{1}{2}\cdot \ln|\sin x| + C$

B) $\frac{1}{2}\cdot \ln|\cos x| + C$

C) $\frac{1}{2}\cdot \ln|\tan x| + C$

D) $\frac{1}{2}\cdot \ln|\cot x| + C$

E) $-\frac{1}{2}\cdot \ln|\tan x| + C$

3. $\int \frac{dx}{1+\cos x} = ?$

A) $\ln|1+\cos x| + C$

B) $\sec x + \cot x + C$

C) $\sec x - \cot x + C$

D) $\operatorname{cosec} x - \cot x + C$

E) $\operatorname{cosec} x + \cot x + C$

4. $\int \frac{dx}{\cos 2x} = ?$

A) $\frac{1}{2}\ln|\cos 2x| + C$

B) $\frac{1}{2}\ln\left|\frac{\sqrt{2}\cos x - 1}{\sqrt{2}\cos x + 1}\right| + C$

C) $\frac{1}{2}\ln\left|\frac{1+\sin 2x}{\cos 2x}\right| + C$

D) $\frac{1}{2}\ln\left|\frac{\sin 2x - 1}{\sin 2x + 1}\right| + C$

E) $\frac{1}{2}\ln\left|\frac{\sin 2x + 1}{\sin 2x - 1}\right| + C$

METROPOL YAYINLARI • METROPOL PUBLICATIONS

5. $\int \frac{\sin 3x}{\sin x}dx = ?$

A) $\ln|\sin 3x| - \ln|\sin x| + C$

B) $x - \cos 2x + C$

C) $x + \cos 2x + c$

D) $x - \sin 2x + C$

E) $x + \sin 2x + C$

6. $\int_0^1 x\cdot e^{(x^2)}dx = ?$

A) $\frac{e-2}{2}$ B) $\frac{e-1}{2}$ C) $\frac{e-3}{2}$ D) $\frac{e}{2}$ E) e

7. $\displaystyle\int \frac{dx}{\cos x \cdot \cot x - 2 \cdot \cot x} = ?$

A) $\ln\left|\frac{1+\tan x}{\cos x}\right| + C$

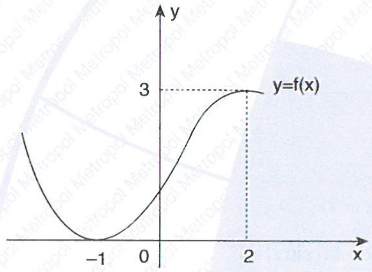
B) $\frac{1}{2} \cdot \ln\left|\frac{1+\cot x}{1-\cot x}\right| + C$

C) $\frac{1}{2} \cdot \ln\left|\frac{\cos x}{\cos x - 2}\right| + C$

D) $\ln\left|\frac{\cos x + 2}{\cos x}\right| + C$

E) $\ln\left|\frac{1+\tan x}{1-\tan x}\right| + C$

8.



$\Rightarrow \displaystyle\int_{-1}^{2} f(x) \cdot f'(x)dx = ?$

A) $\frac{7}{2}$ B) 4 C) $\frac{9}{2}$ D) 5 E) $\frac{10}{3}$

9. $\displaystyle\int_a^b dx - \int_b^a x dx = 12, \ a + b = -8$

$\Rightarrow \displaystyle\int_a^b (3x^2 + 2x)dx = ?$

A) –178 B) –176 C) 0 D) 178 E) 176

10. $\displaystyle\int_{-1}^{1} x^3 \cdot f(\cos x)dx = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

11. $\displaystyle\int \sin 5x \cdot \cos 4x dx - \int \sin 4x \cdot \cos 5x dx = ?$

A) $\frac{1}{20} \cdot \cos 5x \cdot \sin 4x + C$

B) $\frac{1}{20} \cdot \sin 4x \cdot \cos 5x + C$

C) $\sin x + C$

D) $\cos x + C$

E) $-\cos x + C$

12. $f(x) = \displaystyle\int_{x^2-1}^{\cos^2 x} \frac{x+1}{x+2} dx \Rightarrow f'(0) = ?$

A) $\frac{\pi}{\pi - 4}$ B) $\frac{\pi^3}{\pi - 2}$ C) $\frac{\pi^2}{\pi^2 - 4}$ D) $\frac{\pi^3}{\pi^2 - 8}$ E) 0

METROPOL YAYINLARI • METROPOL PUBLICATIONS

YANITLAR / ANSWERS

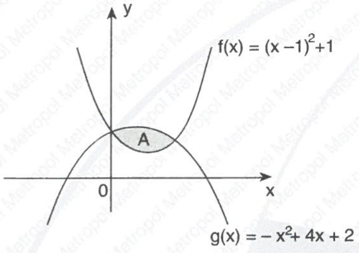
1	2	3	4	5	6	7	8	9	10	11	12
C	C	D	E	E	B	C	C	B	A	E	E

1. $\int_0^1 e^{x^2}\cdot x^3\,dx = ?$

A) $-\frac{1}{2}$ B) $-\frac{1}{3}$ C) $\frac{1}{2}$ D) $\frac{e}{2}$ E) e

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

2.



⇒ **Alan (A) =Area (A)=?**

A) 5 B) 6 C) 7 D) 8 E) 9

[İSTANBUL ÜNİVERSİTESİ – YÖS 2018]

3. $\int \frac{x^3+3x^2+1}{x}dx = ?$

A) $\frac{x^3}{2}+x^2+x+C$

B) $\frac{x^3}{3}+\frac{3x^2}{2}+\ln x+C$

C) $\frac{x^4}{4}+\frac{3x^3}{5}+\frac{1}{x}+C$

D) $x^3+\frac{3x^2}{2}+\frac{1}{x}+C$

E) $\frac{x^4}{4}+\frac{3x^3}{5}+\ln x+C$

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

4. $\int_1^e (x\cdot\ln x + x\cdot\ln^2 x)dx = ?$

A) 0 B) $\frac{e}{2}$ C) $\frac{e^2}{2}$ D) e^2 E) 1

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

5. $\int_1^e (\ln x + 1)dx = ?$

A) 1 B) e C) e−1 D) 1−e E) 2e−1

[İNÖNÜ ÜNİVERSİTESİ – YÖS 2018]

6. $f''(x) = 5x+3,$

$f'(0) = 5,$

$f(0) = -1 \Rightarrow f(1) = ?$

A) $\frac{13}{3}$ B) $\frac{1}{3}$ C) $-\frac{1}{3}$ D) $\frac{19}{3}$ E) -4

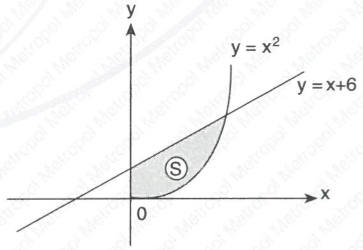
[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

7. $\int_0^1 \sqrt{x\sqrt{x^3\sqrt{x^5}}}\,dx = ?$

A) $\frac{15}{4}$ B) $\frac{8}{23}$ C) $\frac{11}{4}$ D) $\frac{15}{8}$ E) $\frac{23}{8}$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

8.



⇒ **S = ?**

A) 3 B) $\frac{9}{2}$ C) 9 D) $\frac{27}{2}$ E) 27

[İNÖNÜ ÜNİVERSİTESİ – YÖS 2018]

9. $a > 0$,

$$\int_0^a (3x^2+1)dx = \int_0^a (2x+3)dx \Rightarrow \mathbf{a = ?}$$

A) 1 B) 2 C) 3 D) 4 E) 5

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

10. $f: R^+ \to R$

$$x \to f(x) = \log_5 x \Rightarrow \int d(f^{-1}(x)) = ?$$

A) $5^x + C$ B) $\frac{5^x}{\ln 5} + C$ C) $\frac{5^x}{5} + C$

D) $5^x \cdot \ln 5 + C$ E) $5^x - x + C$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

11. $f(x) = \int \sin^3 x \cdot \cos^5 x dx \Rightarrow f\left(\frac{\pi}{2}\right) - f\left(\frac{3\pi}{2}\right) = ?$

A) 3 B) 2 C) 1 D) 0 E) –1

[EGE ÜNİVERSİTESİ – YÖS 2016]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

12. $\int x \cdot e^{-2x} dx = ?$

A) $\frac{e^{-x}}{4} - \frac{e^{-2x}}{2} + C$ B) $-\frac{e^{-x}}{2} - \frac{e^{-2x}}{4} + C$

C) $-\frac{xe^{-x}}{4} - \frac{e^{-2x}}{2} + C$ D) $-\frac{xe^{-2x}}{2} - \frac{e^{-2x}}{4} + C$

E) $-\frac{xe^{-x}}{2} - \frac{xe^{-2x}}{4} + C$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

13. $f(x) = \begin{cases} x^{-1}, & x < e \\ x, & x \geq e \end{cases}$

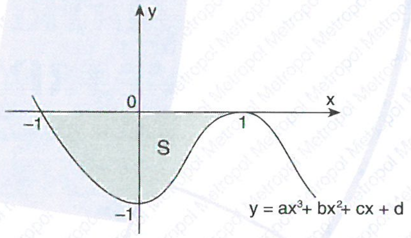
$$\Rightarrow \int_1^3 f(x) \cdot dx = ?$$

A) $\ln 3$ B) $\ln 3 + \frac{9}{2}$ C) $\frac{1}{2} - e$

D) $\frac{11 - e^2}{2}$ E) $\frac{e^2 - 3}{2}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

14.



$\Rightarrow$ **S = ?**

A) $\ln 3$ B) $\ln 3 + \frac{9}{2}$ C) $\frac{1}{2} - e$

D) $\frac{11 - e^2}{2}$ E) $\frac{e^2 - 3}{2}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

YANITLAR / ANSWERS

1	2	3	4	5	6	7
C	E	B	C	B	D	B
8	**9**	**10**	**11**	**12**	**13**	**14**
D	B	A	D	D	D	C

BÖLÜM CHAPTER 18

TARİHSEL NOT / HISTORICAL NOTE

TERENCE TAO [1975 -]

Tao, 9 yaşında üniversite düzeyinde matematik derslerine devam eden, erken yaşlardan itibaren olağanüstü matematiksel yetenekler sergiledi. Tao, ilk on yaşında yarışan Uluslararası Matematik Olimpiyatları'nda bugüne kadarki en genç katılımcıydı; 1986, 1987 ve 1988'de bronz, gümüş ve altın madalya kazandı. Olympiat'ın tarihindeki üç madalyanın her birinin en genç kazananı oldu ve on üçüncü doğum gününden kısa bir süre sonra altın madalya kazandı. Matematik alanında, Tao, Oxford Üniversitesi'nden Ben J. Green ile yaptığı işbirliği ile bilinir; birlikte Green-Tao teoremini kanıtladılar. Onun işbirlikçi zihniyetiyle tanınan Tao, 2006 yılına kadar keşiflerinde 30'dan fazla kişi ile çalışmıştı. Tao tarafından 2016 yılında yaklaşık 300 araştırma yazısı ve 17 kitap yayınlanmıştır. 2 numaralı bir Erdös sayısına sahiptir.

Tao exhibited extraordinary mathematical abilities from an early age, attending university-level mathematics courses at the age of 9. Tao was the youngest participant to date in the International Mathematical Olympiad, first competing at the age of ten; in 1986, 1987, and 1988, he won a bronze, silver, and gold medal. He remains the youngest winner of each of the three medals in the Olympiad's history, winning the gold medal shortly after his thirteenth birthday. Within the field of mathematics, Tao is known for his collaboration with Ben J. Green of Oxford University; together they proved the Green–Tao theorem. Known for his collaborative mindset, by 2006 Tao had worked with over 30 others in his discoveries. By 2016 Tao had published about 300 research papers and 17 books. He has an Erd's number of 2.

MATRİS ve DETERMİNANT
MATRIX and DETERMINANT

Bu bölüm 64 alıştırma sorusu, 124 test sorusu, 12 YÖS sorusu içermektedir.

This chapter includes 64 exercise questions, 124 test questions, and 12 YÖS questions.

BÖLÜM / CHAPTER 18

MATRİS ve DETERMİNANT / MATRIX and DETERMINANT

- Matris ve Determinant / Matrix and Determinant .... 473 – 498

BÖLÜM 18 CHAPTER

MATRİS ve DETERMİNANT
MATRIX and DETERMINANT

1. $\begin{bmatrix} 2 & -3 \\ 4 & 0 \end{bmatrix} + \begin{bmatrix} 5 & -2 \\ -2 & 1 \end{bmatrix} = ?$

Yanıt / The Answer is $\begin{bmatrix} 7 & -5 \\ 2 & 1 \end{bmatrix}$

2. $\begin{bmatrix} 3 & -2 \\ 4 & -1 \end{bmatrix} - 2 \cdot \begin{bmatrix} -1 & -1 \\ 0 & 2 \end{bmatrix} = ?$

Yanıt / The Answer is $\begin{bmatrix} 5 & 0 \\ 4 & -5 \end{bmatrix}$

3. $A = \begin{bmatrix} 1 & -1 \\ 0 & 4 \end{bmatrix}$, $B = \begin{bmatrix} -3 & 4 \\ 1 & -6 \end{bmatrix}$

$\Rightarrow$ **2A − 3B = ?**

Yanıt / The Answer is $\begin{bmatrix} 11 & -14 \\ -3 & 26 \end{bmatrix}$

4. $A = \begin{bmatrix} c & -2 \\ 3 & 2 \end{bmatrix}$, $B = \begin{bmatrix} d & 0 \\ 1 & -c \end{bmatrix}$

$B - 3A = \begin{bmatrix} 6 & 6 \\ -8 & -2 \end{bmatrix}$

$\Rightarrow$ **c + d = ?**

Yanıt / The Answer is −10

5. $\begin{bmatrix} -1 & 3 & a & -2 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 0 \\ 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 0 \end{bmatrix} \Rightarrow a = ?$

Yanıt / The Answer is 3

6. $\begin{bmatrix} 2 & 3 \\ -2 & 0 \end{bmatrix} \cdot \begin{bmatrix} 4 & 1 \\ -2 & 0 \end{bmatrix} = ?$

Yanıt / The Answer is $\begin{bmatrix} 2 & 2 \\ -8 & -2 \end{bmatrix}$

7. $\begin{bmatrix} \sin x & \cos x \\ \cos x & \sin x \end{bmatrix} \cdot \begin{bmatrix} \sin x \\ \cos x \end{bmatrix} = ?$

Yanıt / The Answer is $\begin{bmatrix} 1 \\ \sin 2x \end{bmatrix}$

8. $\begin{bmatrix} 1 & 2 \\ 2 & 3 \\ 0 & -1 \end{bmatrix} \cdot \begin{bmatrix} -1 & 1 & 0 \\ -2 & 2 & 2 \end{bmatrix} = \begin{bmatrix} . & . & a \\ . & b & . \\ c & . & . \end{bmatrix}$

$\Rightarrow$ **a + b + c = ?**

Yanıt / The Answer is 14

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $A=\begin{bmatrix}0 & 1\\ -1 & 2\end{bmatrix} \Rightarrow \mathbf{A^2=?}$

Yanıt / The Answer is $\begin{bmatrix}-1 & 2\\ -2 & 3\end{bmatrix}$

10. $A=\begin{bmatrix}1 & -2\\ 2 & 3\end{bmatrix} \Rightarrow \mathbf{A^2-3A=?}$

Yanıt / The Answer is $\begin{bmatrix}-6 & -2\\ 2 & -4\end{bmatrix}$

11. $A=\begin{bmatrix}4 & 0 & -1\\ 1 & -2 & 1\\ 3 & 0 & 4\end{bmatrix} \Rightarrow \mathbf{A^T=?}$

Yanıt / The Answer is $\begin{bmatrix}4 & 1 & 3\\ 0 & -2 & 0\\ -1 & 1 & 4\end{bmatrix}$

12. $A=\begin{bmatrix}3 & 2\\ x-3 & 7\end{bmatrix},\ A^T=\begin{bmatrix}3 & 4\\ 2 & 7\end{bmatrix} \Rightarrow \mathbf{x=?}$

Yanıt / The Answer is 7

13. $A=\begin{bmatrix}2 & -3 & 4\\ 0 & -1 & 3\end{bmatrix},\ B=\begin{bmatrix}2 & x-2y\\ -3 & x-y\\ 4 & 3\end{bmatrix}$

$A^T=B \Rightarrow \mathbf{x+y=?}$

Yanıt / The Answer is −3

14. $A=\begin{bmatrix}1 & 0\\ -2 & 3\end{bmatrix},\ B=\begin{bmatrix}2 & -1\\ 0 & 1\end{bmatrix}$

$\mathbf{A^T+B^T=?}$

Yanıt / The Answer is $\begin{bmatrix}3 & -2\\ -1 & 4\end{bmatrix}$

15. $A=\begin{bmatrix}1 & 2\\ 0 & -1\end{bmatrix}\cdot\begin{bmatrix}3 & 2 & 1\\ -2 & 0 & 1\end{bmatrix}$

$A^T=\begin{bmatrix}x & 2\\ 2 & y\\ z & -1\end{bmatrix} \Rightarrow \mathbf{x+y-z=?}$

Yanıt / The Answer is −4

16. $A=\begin{bmatrix}1 & -1\\ 0 & 2\end{bmatrix},\ f(x)=x^2+2x+1$

$\Rightarrow \mathbf{f(A)=?}$

Yanıt / The Answer is $\begin{bmatrix}4 & -5\\ 0 & 9\end{bmatrix}$

METROPOL YAYINLARI • METROPOL PUBLICATIONS

17. $A=\begin{bmatrix}1 & 0\\ 2 & -1\end{bmatrix} \Rightarrow \mathbf{A^4=?}$

Yanıt / The Answer is $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$

18. $A=\begin{bmatrix}1 & 3\\ 0 & -1\end{bmatrix} \Rightarrow \mathbf{A^{13}=?}$

Yanıt / The Answer is $\begin{bmatrix}1 & 3\\ 0 & -1\end{bmatrix}$

19. $A=\begin{bmatrix}-3 & -2\\ 0 & 3\end{bmatrix} \Rightarrow \mathbf{A^{2018}=?}$

Yanıt / The Answer is $3^{2018}\cdot\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$

20. $A=\begin{bmatrix}1 & -1\\ 0 & 1\end{bmatrix} \Rightarrow \mathbf{A^{32}=?}$

Yanıt / The Answer is $\begin{bmatrix}1 & -32\\ 0 & 1\end{bmatrix}$

21. $A=\begin{bmatrix}2 & 2\\ -8 & -8\end{bmatrix},\ A^2=k\cdot A \Rightarrow \mathbf{k=?}$

Yanıt / The Answer is **–6**

22. $A=\begin{bmatrix}-3 & 5\\ 1 & -2\end{bmatrix} \Rightarrow \mathbf{A^{-1}=?}$

Yanıt / The Answer is $\begin{bmatrix}-2 & -5\\ -1 & -3\end{bmatrix}$

23. $A=\begin{bmatrix}3 & 2\\ 1 & 2\end{bmatrix} \Rightarrow \mathbf{A^{-1}=?}$

Yanıt / The Answer is $\begin{bmatrix}\frac{1}{2} & -\frac{1}{2}\\ -\frac{1}{4} & \frac{3}{4}\end{bmatrix}$

24. $A=\begin{bmatrix}-3 & -2\\ 2 & 1\end{bmatrix},\ A^{-1}=\begin{bmatrix}a & b\\ c & d\end{bmatrix} \Rightarrow \mathbf{c=?}$

Yanıt / The Answer is **–2**

METROPOL YAYINLARI • METROPOL PUBLICATIONS

25. $A=\begin{bmatrix} x & 4 \\ y & -4 \end{bmatrix}$, $A \cdot A^{-1} = A^2$

$\Rightarrow$ $\mathbf{x \cdot y = ?}$

Yanıt / The Answer is -15

26. $A=\begin{bmatrix} 1 & -2 \\ 3 & -7 \end{bmatrix}$, $B=\begin{bmatrix} 7 & x \\ -2 & y \end{bmatrix}$

$A^{-1} = B^T \Rightarrow \mathbf{x + y = ?}$

Yanıt / The Answer is 2

27. $A=\begin{bmatrix} \tan x & 0 \\ 0 & \cos x \end{bmatrix} \Rightarrow \mathbf{A^{-1} = ?}$

Yanıt / The Answer is $\begin{bmatrix} \cot x & 0 \\ 0 & \sec x \end{bmatrix}$

28. $A=\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \Rightarrow \mathbf{A^{-2} = ?}$

Yanıt / The Answer is $\begin{bmatrix} \frac{11}{2} & -\frac{5}{2} \\ -\frac{15}{4} & \frac{7}{4} \end{bmatrix}$

29. $A=\begin{bmatrix} x & 0 \\ 1 & y \end{bmatrix}$, $A = A^{-1} \Rightarrow \mathbf{x + y = ?}$

Yanıt / The Answer is 0

30. $\begin{vmatrix} 2 & 3 \\ -2 & 1 \end{vmatrix} = ?$

Yanıt / The Answer is 8

31. $\begin{vmatrix} x+2 & 2 \\ x-2 & 2 \end{vmatrix} = ?$

Yanıt / The Answer is 8

32. $\begin{vmatrix} 2018 & 2019 \\ 2016 & 2017 \end{vmatrix} = ?$

Yanıt / The Answer is 2

METROPOL YAYINLARI • METROPOL PUBLICATIONS

33. $\begin{vmatrix} x & 2 \\ x-1 & 3 \end{vmatrix} = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\{-2\}$

37. $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = 8 \Rightarrow \begin{vmatrix} \mathbf{c} & \mathbf{d} \\ \mathbf{a} & \mathbf{b} \end{vmatrix} = ?$

Yanıt / The Answer is **−8**

34. $\begin{vmatrix} x+1 & -1 \\ x & 2x \end{vmatrix} = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\left\{-\frac{3}{2}, 0\right\}$

38. $f(x) = \begin{vmatrix} \log_3 x & x^2 \\ -x & \log_x 9 \end{vmatrix}$

$\Rightarrow$ **f(−1) + f(1) = ?**

Yanıt / The Answer is **4**

35. $\begin{vmatrix} 2x+6 & k \\ x-1 & x \end{vmatrix} = 0,\ \text{ÇK(SS)} = \{-1, x_2\} \Rightarrow$ **k = ?**

Yanıt / The Answer is **2**

39. $\begin{vmatrix} 2 & -1 & 1 \\ 3 & -2 & 5 \\ 0 & 0 & 0 \end{vmatrix} = ?$

Yanıt / The Answer is **0**

36. $\begin{vmatrix} \sin x & -\cos x \\ -\cos x & -\sin x \end{vmatrix} = ?$

Yanıt / The Answer is **−1**

40. $\begin{vmatrix} 0 & 2 & -3 \\ 0 & -7 & 5 \\ 0 & 0 & 3 \end{vmatrix} = ?$

Yanıt / The Answer is **0**

METROPOL YAYINLARI • METROPOL PUBLICATIONS

41. $\begin{vmatrix} 1 & 3 & -2 \\ -2 & 0 & 4 \\ 4 & 0 & 8 \end{vmatrix} = ?$

Yanıt / The Answer is 96

42. $\begin{vmatrix} -3 & 1 & -2 \\ -5 & 7 & -1 \\ 6 & -2 & 4 \end{vmatrix} = ?$

Yanıt / The Answer is 0

43. $\begin{vmatrix} 1 & 1 & 4 \\ 3 & 1 & -2 \\ -1 & 1 & 5 \end{vmatrix} = ?$

Yanıt / The Answer is 10

44. $\begin{vmatrix} 1 & 0 & 3 \\ 4 & 5 & 2 \\ 6 & 4 & m \end{vmatrix} = 10 \Rightarrow m = ?$

Yanıt / The Answer is 12

45. $\begin{vmatrix} x & 0 & x \\ -1 & 3 & 3 \\ -1 & 3 & x \end{vmatrix} = -6 \Rightarrow \sum x = ?$

Yanıt / The Answer is 3

46. $i^2 = -1 \Rightarrow \begin{vmatrix} i & -i & 1 \\ 0 & i & 1 \\ 0 & i-1 & 1 \end{vmatrix} = ?$

Yanıt / The Answer is i

47. $\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & k \end{vmatrix} = -10 \Rightarrow \begin{vmatrix} -a & -b & -c \\ d & e & f \\ 2g & 2h & 2k \end{vmatrix} = ?$

Yanıt / The Answer is 20

48. $\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & k \end{vmatrix} = 5 \Rightarrow \begin{vmatrix} 3a & 3b & 3c \\ -d & -e & -f \\ g & h & k \end{vmatrix} = ?$

Yanıt / The Answer is −15

METROPOL YAYINLARI • METROPOL PUBLICATIONS

49. $A = \begin{bmatrix} 2 & 3 & -1 \\ 2 & 0 & 2 \\ 1 & -1 & -1 \end{bmatrix} \Rightarrow |A^{-1}| = ?$

Yanıt / The Answer is $\frac{1}{18}$

50. $i^2 = -1 \Rightarrow \begin{vmatrix} 2 & i \\ 1-i & 1 \end{vmatrix} = ?$

Yanıt / The Answer is $1-i$

51. $\begin{vmatrix} 2\cos x & -1 \\ -1 & \cos x \end{vmatrix} = 0,$

$0 < x < \frac{\pi}{2} \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is $\frac{\pi}{4}$

52. $\begin{vmatrix} -1 & \sin x \\ 2 \cdot \sin x & -1 \end{vmatrix} = 0,$

$0 < x < \frac{\pi}{2} \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is $\frac{\pi}{4}$

53. $A = \begin{bmatrix} 2 & -1 \\ -3 & 2 \end{bmatrix} \Rightarrow |A^{-1} - 2A| = ?$

Yanıt / The Answer is -23

54. $\begin{vmatrix} -1 & 2 & 3 \\ 1 & 0 & 2 \\ 0 & 0 & 3 \end{vmatrix} = ?$

Yanıt / The Answer is -6

55. $\begin{vmatrix} 73878 & 73879 \\ 73876 & 73877 \end{vmatrix} = ?$

Yanıt / The Answer is 2

56. $\begin{vmatrix} x & x & x \\ 3 & 2 & 1 \\ 1 & 1 & 2 \end{vmatrix} = 2x - 9 \Rightarrow \mathbf{x = ?}$

Yanıt / The Answer is 3

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57. $x^2-5x-3=0, f(x_1)=f(x_2)=0$

$$\Rightarrow \begin{vmatrix} -x_1 & x_2-2 \\ x_1-2 & x_2 \end{vmatrix} = ?$$

Yanıt / The Answer is 12

58. $A=\begin{bmatrix} -10 & 4 \\ 6 & -2 \end{bmatrix} \Rightarrow \det(A^{30})=?$

Yanıt / The Answer is 2^{60}

59. $\begin{vmatrix} x+1 & 2 & 3 \\ 1 & x+2 & 3 \\ 1 & 2 & x+3 \end{vmatrix} = 0 \Rightarrow ÇK(SS)=?$

Yanıt / The Answer is $\{-6,0\}$

60. $A=\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}, B=\begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}$ $A \cdot X = B \Rightarrow |X| = ?$

Yanıt / The Answer is 1

61. $\begin{vmatrix} 1 & 3 & 5 \\ 3 & 0 & 7 \\ 1 & 3 & a-9 \end{vmatrix} = 0 \Rightarrow a=?$

Yanıt / The Answer is 14

62. $\begin{vmatrix} \frac{1}{\log_8 2} & \log_4 5 \\ \log_5 4 & \log_3 27 \end{vmatrix} = ?$

Yanıt / The Answer is 8

63. $A=\begin{bmatrix} 1 & -2 \\ 0 & a \end{bmatrix}, B=\begin{bmatrix} a & 0 \\ -3 & -1 \end{bmatrix}$

$\det(A+B)=\det(A)+\det(B) \Rightarrow a=?$

Yanıt / The Answer is $\sqrt{7}$

64. $A=\begin{bmatrix} 0 & 3 \\ 2 & -2 \end{bmatrix} \Rightarrow |A^T-A|=?$

Yanıt / The Answer is 1

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1. $A=\begin{bmatrix}1 & x & -2\\ 0 & 1 & x+y\end{bmatrix}$, $B=\begin{bmatrix}1 & 3 & -2\\ 0 & 1 & 5\end{bmatrix}$,

$A = B \Rightarrow$ **y = ?**

A) –1 B) 1 C) 2 D) 3 E) 4

2. $A=\begin{bmatrix}2 & 4 & -5\\ \cos 90^\circ & m & 3\end{bmatrix}$, $B=\begin{bmatrix}\log_3(x+4) & n & p\\ a & 4 & b\end{bmatrix}$

$A = B \Rightarrow$ **$a+b+m+n+x-p=?$**

A) 11 B) 14 C) 16 D) 20 E) 21

3. $\begin{bmatrix}1 & 3 & -5\\ x-2 & 4 & 0\\ 2 & -3 & 2y\end{bmatrix}=\begin{bmatrix}1 & 3 & a+3\\ 5 & 4 & 0\\ 2 & b+3 & 8\end{bmatrix}$

$\Rightarrow$ **$(x+y)\cdot(a-b)=?$**

A) –33 B) –22 C) –11 D) 11 E) 22

4. $A=\begin{bmatrix}3 & 2 & -1\\ 4 & 6 & 0\end{bmatrix}$,$B=\begin{bmatrix}-2 & 1 & 5\\ 0 & 4 & 2\end{bmatrix}$ $\Rightarrow$ **$A-B=?$**

A) $\begin{bmatrix}5 & 1 & -6\\ 4 & 2 & -2\end{bmatrix}$ B) $\begin{bmatrix}5 & 2 & 2\\ 4 & 1 & 6\end{bmatrix}$ C) $\begin{bmatrix}5 & 2 & -6\\ 4 & 1 & -2\end{bmatrix}$

D) $\begin{bmatrix}5 & 1 & -6\\ 4 & 2 & 2\end{bmatrix}$ E) $\begin{bmatrix}5 & 1 & 6\\ 4 & 2 & -2\end{bmatrix}$

5. $A=\begin{bmatrix}1 & 2\\ -2 & 0\\ 3 & 5\end{bmatrix}$,$B=\begin{bmatrix}2 & 1\\ 0 & 5\\ 2 & -2\end{bmatrix}$ $\Rightarrow$ **$A+B=?$**

A) $\begin{bmatrix}3 & 3\\ 2 & 5\\ 5 & 3\end{bmatrix}$ B) $\begin{bmatrix}3 & 3\\ 2 & -5\\ 5 & 3\end{bmatrix}$ C) $\begin{bmatrix}3 & 3\\ -2 & 5\\ 5 & 3\end{bmatrix}$

D) $\begin{bmatrix}3 & 3\\ -2 & 5\\ 3 & 5\end{bmatrix}$ E) $\begin{bmatrix}3 & 3\\ 5 & -2\\ 5 & 3\end{bmatrix}$

6. $A=\begin{bmatrix}2 & 1 & x\\ 3 & y & -1\end{bmatrix}+\begin{bmatrix}0 & 2 & 1\\ 4 & 5 & -3\end{bmatrix}=\begin{bmatrix}2 & 3 & 4\\ 7 & 0 & -4\end{bmatrix}$ $\Rightarrow$ **$x+y=?$**

A) –3 B) –2 C) 0 D) 2 E) 3

7. $\begin{bmatrix}a-2 & b+4\\ c-2 & 2d-5\end{bmatrix}=\begin{bmatrix}2 & 6\\ -c-6 & 5\end{bmatrix}+\begin{bmatrix}-1 & -3\\ 2 & 5-d\end{bmatrix}$

$\Rightarrow$ **$a+b+c+d=?$**

A) 12 B) 6 C) 2 D) 1 E) 24

8. $x\cdot\begin{bmatrix}5\\ -2\end{bmatrix}+y\cdot\begin{bmatrix}-2\\ 1\end{bmatrix}=\begin{bmatrix}10\\ 4\end{bmatrix}$ $\Rightarrow$ **y = ?**

A) 40 B) 42 C) 44 D) 46 E) 48

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9. $a\cdot\begin{bmatrix}2\\3\end{bmatrix}+b\cdot\begin{bmatrix}3\\1\end{bmatrix}=\begin{bmatrix}9\\10\end{bmatrix} \Rightarrow$ **$a\cdot b=?$**

A) 3 B) 6 C) 9 D) 12 E) 15

10. $x\cdot\begin{bmatrix}2&0\\0&-1\end{bmatrix}+y\cdot\begin{bmatrix}-3&0\\0&1\end{bmatrix}=\begin{bmatrix}4&0\\0&-3\end{bmatrix} \Rightarrow$ **$x=?$**

A) 2 B) 5 C) 6 D) 7 E) 9

11. $x\cdot\begin{bmatrix}2\\-3\end{bmatrix}+y\cdot\begin{bmatrix}-1\\4\end{bmatrix}=\begin{bmatrix}7\\-13\end{bmatrix} \Rightarrow$ **$3y-x=?$**

A) –6 B) –2 C) –1 D) 3 E) 4

12. $\begin{bmatrix}3x+3\\-y\end{bmatrix}+\begin{bmatrix}-2y\\5x\end{bmatrix}=\begin{bmatrix}15\\20\end{bmatrix} \Rightarrow$ **$x-y=?$**

A) 1 B) 2 C) 3 D) 4 E) 5

13. $A=\begin{bmatrix}0&a\\b&c\end{bmatrix}$, $B=\begin{bmatrix}1&-1\\3&6\end{bmatrix}$, $A+B=I_2 \Rightarrow$ **$a+b+c=?$**

A) –7 B) –6 C) –5 D) –4 E) –3

14. $A=\begin{bmatrix}3&0\\0&-2\end{bmatrix}$, $B=\begin{bmatrix}2&0\\0&1\end{bmatrix}$, $C=\begin{bmatrix}7&0\\0&2\end{bmatrix}$

$A\cdot x+B\cdot y=C \Rightarrow$ **$x+y=?$**

A) $-\frac{1}{15}$ B) – 3 C) $\frac{23}{7}$ D) 3 E) $\frac{23}{10}$

15. $A=\begin{bmatrix}\log 9&2\\m&1\end{bmatrix}$, $B=\begin{bmatrix}\log 3&3\\-2&n\end{bmatrix}$, $C=\begin{bmatrix}\log x&-1\\-14&-5\end{bmatrix}$

$4A-3B=C \Rightarrow$ **$m+n+x=?$**

A) 171 B) 192 C) 213 D) 228 E) 241

16. $A=\begin{bmatrix}-1&3\\5&0\end{bmatrix}$, $B=\begin{bmatrix}\frac{1}{2}&3\\-2&-\frac{1}{4}\end{bmatrix}$

$3A-4B=\begin{bmatrix}a&b\\c&d\end{bmatrix} \Rightarrow$ **$a+b+c+d=?$**

A) 13 B) 15 C) 16 D) 18 E) 20

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1	2	3	4	5	6	7	8
C	E	B	A	C	B	B	A
9	10	11	12	13	14	15	16
A	B	A	D	A	C	E	C

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1. $A-B=\begin{bmatrix}2 & 1\\ 1 & -1\end{bmatrix}$, $A-2B=\begin{bmatrix}1 & 2\\ -1 & 1\end{bmatrix}$ $\Rightarrow$ **A = ?**

A) $\begin{bmatrix}3 & 0\\ 3 & -3\end{bmatrix}$ B) $\begin{bmatrix}3 & 0\\ -3 & 3\end{bmatrix}$ C) $\begin{bmatrix}3 & 0\\ -3 & -3\end{bmatrix}$

D) $\begin{bmatrix}-3 & 0\\ 3 & -3\end{bmatrix}$ E) $\begin{bmatrix}-3 & 0\\ -3 & -3\end{bmatrix}$

2. $A+2B=\begin{bmatrix}2 & 1 & 0\\ 1 & -1 & 2\end{bmatrix}$, $2A+B=\begin{bmatrix}1 & 2 & -1\\ 2 & 0 & 1\end{bmatrix}$ $\Rightarrow$ **B = ?**

A) $\begin{bmatrix}1 & 0 & 1/3\\ 0 & -2/3 & 1\end{bmatrix}$ B) $\begin{bmatrix}1 & 0 & 3\\ 0 & -2 & 1\end{bmatrix}$

C) $\begin{bmatrix}1 & 0 & -1/3\\ 0 & 2/3 & -1\end{bmatrix}$ D) $\begin{bmatrix}1 & 0 & 1/3\\ 0 & 2/3 & 1\end{bmatrix}$

E) $\begin{bmatrix}1 & 0 & -1\\ 0 & 3 & -1\end{bmatrix}$

3. $A=[2\ \ 3\ \ 4]$, $B=\begin{bmatrix}-2\\ 4\\ 5\end{bmatrix}$ $\Rightarrow$ **A·B = ?**

A) [22] B) [23] C) [27] D) [28] E) [30]

4. $A=\begin{bmatrix}2\\ 3\\ 4\end{bmatrix}$, $B=[-2\ \ 3]$ $\Rightarrow$ **A·B = ?**

A) $\begin{bmatrix}-4 & -6\\ -6 & -9\\ -8 & -12\end{bmatrix}$ B) $\begin{bmatrix}-4 & 6\\ -6 & 9\\ -8 & 12\end{bmatrix}$

C) $\begin{bmatrix}-4 & -6\\ -6 & 9\\ -8 & 12\end{bmatrix}$ D) $\begin{bmatrix}-4 & -6\\ -6 & 9\\ 8 & 12\end{bmatrix}$

E) $\begin{bmatrix}4 & 6\\ 6 & 9\\ 8 & 12\end{bmatrix}$

5. $A=[-5\ \ 3+x]$, $B=\begin{bmatrix}x\\ 3\end{bmatrix}$

$A\cdot B=[7]$ $\Rightarrow$ **x = ?**

A) –2 B) –1 C) 1 D) 2 E) 3

6. $[2\ \ x\ \ 16]\cdot\begin{bmatrix}3x\\ -2\\ -1\end{bmatrix}=[0]$ $\Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

7. $A=\left[1\ \ \frac{1}{3}\ \ \frac{1}{5}\right]$, $B=\begin{bmatrix}\log x\\ \log x^3\\ \log x^5\end{bmatrix}$

$A\cdot B=[\log 64]$ $\Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

8. $\begin{bmatrix}a & -2\\ 2 & -1\end{bmatrix}\cdot\begin{bmatrix}1 & 5\\ 2 & b\end{bmatrix}=\begin{bmatrix}-1 & x\\ 0 & 9\end{bmatrix}$ $\Rightarrow$ **x = ?**

A) –1 B) 7 C) 9 D) 13 E) 17

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9. $\begin{bmatrix}1 & 2\\3 & -1\end{bmatrix}\cdot\begin{bmatrix}x & 2\\y & 1\end{bmatrix}=\begin{bmatrix}5 & 4\\-6 & 5\end{bmatrix} \Rightarrow$ **x + y = ?**

A) 1　B) 2　C) 3　D) 4　E) 5

10. $\begin{bmatrix}1 & 3\\-1 & 2\end{bmatrix}\cdot\begin{bmatrix}a & a\\b & b\end{bmatrix}=\begin{bmatrix}3 & 3\\7 & 7\end{bmatrix} \Rightarrow$ **a + b = ?**

A) –5　B) –1　C) 1　D) 2　E) 3

11. $A=\begin{bmatrix}-3 & 2\\1 & -2\end{bmatrix}$ $B=\begin{bmatrix}a & b\\c & d\end{bmatrix}$ $C=\begin{bmatrix}-2 & -6\\2 & -2\end{bmatrix}$

A·B = C $\Rightarrow$ **(b – c)·(a + d) = ?**

A) 9　B) 12　C) 15　D) 18　E) 21

12. $A=\begin{bmatrix}1 & 2 & 3\\-3 & 0 & -1\end{bmatrix}$, $B=\begin{bmatrix}0 & 2\\1 & 0\\1 & 0\end{bmatrix}$,

$A\cdot B=\begin{bmatrix}x & y\\z & t\end{bmatrix} \Rightarrow$ **x + y + z – t = ?**

A) 0　B) 6　C) 8　D) 10　E) 12

13. $A=\begin{bmatrix}4 & 1\\3 & 2\end{bmatrix}$, $B=\begin{bmatrix}1 & 2\\3 & 4\end{bmatrix}$

A·B = C (mod5) $\Rightarrow$ **C = ?**

A) $\begin{bmatrix}2 & 3\\4 & 3\end{bmatrix}$　B) $\begin{bmatrix}1 & 3\\4 & 1\end{bmatrix}$　C) $\begin{bmatrix}3 & 0\\0 & 4\end{bmatrix}$

D) $\begin{bmatrix}2 & 2\\4 & 4\end{bmatrix}$　E) $\begin{bmatrix}2 & 1\\4 & 4\end{bmatrix}$

14. $A=\begin{bmatrix}1 & 0\\2 & 3\end{bmatrix}$, $B=\begin{bmatrix}-2 & 0\\1 & 3\end{bmatrix}$, $C=\begin{bmatrix}-2 & 1\\0 & 2\end{bmatrix}$

$\Rightarrow$ **A·(B + C) = ?**

A) $\begin{bmatrix}-4 & 1\\-5 & 17\end{bmatrix}$　B) $\begin{bmatrix}4 & 1\\-5 & 17\end{bmatrix}$　C) $\begin{bmatrix}-4 & -1\\-5 & 17\end{bmatrix}$

D) $\begin{bmatrix}-4 & -1\\-5 & -17\end{bmatrix}$　E) $\begin{bmatrix}4 & 1\\5 & 17\end{bmatrix}$

15. $A=\begin{bmatrix}2 & -1\\3 & 1\end{bmatrix}$, $B=\begin{bmatrix}-2 & 1\\1 & 4\end{bmatrix}$

$\Rightarrow$ **A·B + B·A = ?**

A) $\begin{bmatrix}-6 & -1\\9 & 10\end{bmatrix}$　B) $\begin{bmatrix}-6 & 1\\9 & 10\end{bmatrix}$　C) $\begin{bmatrix}6 & 1\\9 & 10\end{bmatrix}$

D) $\begin{bmatrix}6 & -1\\9 & 10\end{bmatrix}$　E) $\begin{bmatrix}6 & 1\\-9 & 10\end{bmatrix}$

16. $\begin{bmatrix}2 & -5 & -2\\1 & 2 & -4\\3 & -4 & -6\end{bmatrix}\cdot\begin{bmatrix}x\\y\\z\end{bmatrix}=\begin{bmatrix}7\\3\\5\end{bmatrix} \Rightarrow$ **y = ?**

A) 9　B) 7　C) 5　D) 3　E) 1

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1	2	3	4	5	6	7	8
A	A	D	B	C	D	D	D
9	10	11	12	13	14	15	16
A	B	C	E	D	A	B	C

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1. $f(x) = x^2,\ A = \begin{bmatrix} 2 & 3 \\ 4 & 4 \end{bmatrix} \Rightarrow$ **f(A) = ?**

A) $\begin{bmatrix} 16 & 12 \\ 24 & 28 \end{bmatrix}$ B) $\begin{bmatrix} 16 & 12 \\ 18 & 28 \end{bmatrix}$ C) $\begin{bmatrix} 16 & 18 \\ 24 & 28 \end{bmatrix}$ D) $\begin{bmatrix} 12 & -12 \\ 24 & 28 \end{bmatrix}$ E) $\begin{bmatrix} -16 & 18 \\ 24 & 28 \end{bmatrix}$

2. $A = \begin{bmatrix} 1 & 0 \\ 0 & -2 \end{bmatrix},\ I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix},\ f(x) = 2x^2 + 1 \Rightarrow$ **f(A) = ?**

A) $\begin{bmatrix} 3 & 1 \\ 1 & 9 \end{bmatrix}$ B) $\begin{bmatrix} 1 & 3 \\ 9 & 1 \end{bmatrix}$ C) $\begin{bmatrix} 3 & 0 \\ 0 & 9 \end{bmatrix}$ D) $\begin{bmatrix} 0 & 9 \\ 3 & 0 \end{bmatrix}$ E) $\begin{bmatrix} 3 & 9 \\ 0 & 0 \end{bmatrix}$

3. $A = \begin{bmatrix} 1 & 2 \\ 3 & 2 \end{bmatrix} \Rightarrow$ **$A^2 - 2A + I = ?$**

A) $\begin{bmatrix} 6 & -2 \\ 3 & 7 \end{bmatrix}$ B) $\begin{bmatrix} -6 & -2 \\ 3 & 7 \end{bmatrix}$ C) $\begin{bmatrix} -6 & -2 \\ -3 & -7 \end{bmatrix}$ D) $\begin{bmatrix} 6 & 2 \\ 3 & 7 \end{bmatrix}$ E) $\begin{bmatrix} 6 & 2 \\ -3 & 7 \end{bmatrix}$

4. $f(x) = x^2 - x + 2,$

$A = \begin{bmatrix} 3 & 1 \\ -1 & 1 \end{bmatrix} \Rightarrow$ **f(A) = ?**

A) $\begin{bmatrix} 7 & 2 \\ -3 & 1 \end{bmatrix}$ B) $\begin{bmatrix} 7 & 3 \\ -3 & 1 \end{bmatrix}$ C) $\begin{bmatrix} 5 & 3 \\ 3 & 1 \end{bmatrix}$ D) $\begin{bmatrix} 5 & 2 \\ -3 & 1 \end{bmatrix}$ E) $\begin{bmatrix} 7 & 2 \\ -2 & 1 \end{bmatrix}$

5. $A = \begin{bmatrix} 2 & -1 \\ 0 & 3 \end{bmatrix},\ f(x) = x^2 - 3x + 2 \Rightarrow$ **f(A) = ?**

A) $\begin{bmatrix} 1 & -2 \\ 0 & 3 \end{bmatrix}$ B) $\begin{bmatrix} -2 & 1 \\ 0 & 3 \end{bmatrix}$ C) $\begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$ D) $2 \cdot \begin{bmatrix} -2 & 1 \\ 0 & 3 \end{bmatrix}$ E) $2 \cdot \begin{bmatrix} 0 & -1 \\ 0 & 1 \end{bmatrix}$

6. $f(x) = x^2 - 3x + 2,\ A = \begin{bmatrix} -1 & 3 \\ 2 & 1 \end{bmatrix},$

$f(A) = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \Rightarrow$ **$a - b + c - d = ?$**

A) 6 B) 8 C) 9 D) 12 E) 16

7. $f(x) = x^2 - 3x + 4,\ A = \begin{bmatrix} 3 & -1 \\ 0 & 2 \end{bmatrix}$

$\Rightarrow$ **f(A) = ?**

A) $\begin{bmatrix} 4 & -2 \\ 0 & 2 \end{bmatrix}$ B) $\begin{bmatrix} 3 & -2 \\ 2 & 0 \end{bmatrix}$ C) $\begin{bmatrix} 4 & -2 \\ 2 & 0 \end{bmatrix}$ D) $\begin{bmatrix} 3 & 2 \\ -2 & 0 \end{bmatrix}$ E) $\begin{bmatrix} 0 & 2 \\ -2 & 4 \end{bmatrix}$

8. $A = \begin{bmatrix} 3 & 0 \\ 0 & 5 \end{bmatrix},\ A^3 = \begin{bmatrix} m & 0 \\ 0 & 125 \end{bmatrix} \Rightarrow$ **m = ?**

A) –1 B) 9 C) 27 D) 54 E) 81

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9. $A=\begin{bmatrix}3 & 0\\ 3 & 1\end{bmatrix}$, $A^5=\begin{bmatrix}a & b\\ c & d\end{bmatrix}$ $\Rightarrow$ **a + c = ?**

A) 600 B) 603 C) 606 D) 609 E) 612

10. $A=\begin{bmatrix}1 & 3\\ 1 & -1\end{bmatrix}$ $\Rightarrow$ $\mathbf{A^{15}}$ **= ?**

A) $2\cdot A$ B) $2^7\cdot A$ C) $2^{14}\cdot A$ D) $2^{21}\cdot A$ E) $2^{28}\cdot A$

11. $A=\begin{bmatrix}1 & 2\\ 0 & 1\end{bmatrix}$ $\Rightarrow$ $\mathbf{A^{64}}$ **= ?**

A) $\begin{bmatrix}1 & 2^7\\ 0 & 1\end{bmatrix}$ B) $\begin{bmatrix}1 & 2^6\\ 0 & 1\end{bmatrix}$ C) $\begin{bmatrix}1 & 2^5\\ 0 & 1\end{bmatrix}$ D) $\begin{bmatrix}1 & 2^4\\ 0 & 1\end{bmatrix}$ E) $\begin{bmatrix}1 & 2^3\\ 0 & 1\end{bmatrix}$

12. $A=\begin{bmatrix}2 & k\\ 1 & -2\end{bmatrix}$, $A^{10}=\begin{bmatrix}32 & 0\\ 0 & 32\end{bmatrix}$ $\Rightarrow$ **k = ?**

A) −1 B) 0 C) −4 D) 2 E) −2

13. $\begin{bmatrix}-1 & 1\\ 3 & 1\end{bmatrix}$ $\Rightarrow$ $\mathbf{A^{30}}$ **= ?**

A) $2^{15}\cdot A$ B) $2^{30}\cdot A$ C) $2^{45}\cdot A$ D) $2^{60}\cdot A$ E) $2^{75}\cdot A$

14. $A=\begin{bmatrix}3 & 2\\ 0 & -3\end{bmatrix}$ $\Rightarrow$ $\mathbf{A^{33}}$ **= ?**

A) I B) $3^{32}\cdot I$ C) $3^{32}\cdot A$ D) $3^{17}\cdot A$ E) $9^{15}\cdot A$

15. $i^2=-1$,

$A=\begin{bmatrix}0 & i\\ i & 0\end{bmatrix}$ $\Rightarrow$ $\mathbf{A^{16}}$ **= ?**

A) $\begin{bmatrix}i & 0\\ 0 & i\end{bmatrix}$ B) $\begin{bmatrix}0 & i\\ -i & 0\end{bmatrix}$ C) $\begin{bmatrix}0 & 1\\ 1 & 0\end{bmatrix}$ D) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ E) $\begin{bmatrix}-i & 0\\ 0 & -i\end{bmatrix}$

16. $A=\begin{bmatrix}3 & -2\\ 4 & -3\end{bmatrix}$ $\Rightarrow$ $\mathbf{A^{1905}}$ **= ?**

A) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ B) $\begin{bmatrix}-3 & 2\\ -4 & 3\end{bmatrix}$ C) $\begin{bmatrix}3 & 2\\ -4 & 3\end{bmatrix}$ D) $\begin{bmatrix}-1 & 0\\ 0 & -1\end{bmatrix}$ E) $\begin{bmatrix}3 & -2\\ 4 & -3\end{bmatrix}$

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1	2	3	4	5	6	7	8
C	C	D	B	E	C	A	C
9	10	11	12	13	14	15	16
C	C	A	E	B	C	D	B

1. $A=\begin{bmatrix} x & y \\ -3 & -1 \end{bmatrix}$, $A^T+A=\begin{bmatrix} 2 & -1 \\ z & -2 \end{bmatrix}$ $\Rightarrow$ **x + y + z = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

2. $A=\begin{bmatrix} -2 & 4 \\ 0 & 2x-y \\ 3 & 1 \end{bmatrix}$, $B=\begin{bmatrix} -2 & 0 & 3 \\ x+y & 5 & 1 \end{bmatrix}$

$A = B^T \Rightarrow$ **$3x - y^2$ = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

3. $A=\begin{bmatrix} 2 & -3 \\ 1 & 0 \end{bmatrix}$, $B=\begin{bmatrix} 1 & 2 \\ -3 & 0 \end{bmatrix}$

$\Rightarrow$ **$2 \cdot A - 3 \cdot B^T$ = ?**

A) $\begin{bmatrix} 2 & 3 \\ -4 & 0 \end{bmatrix}$ B) $\begin{bmatrix} 1 & 3 \\ -4 & 0 \end{bmatrix}$ C) $\begin{bmatrix} 1 & 3 \\ -5 & 2 \end{bmatrix}$ D) $\begin{bmatrix} 2 & 3 \\ -4 & 2 \end{bmatrix}$ E) $\begin{bmatrix} 1 & -4 \\ 3 & 0 \end{bmatrix}$

4. $A=\begin{bmatrix} 3 & 5 \\ 0 & -2 \end{bmatrix}$, $B=\begin{bmatrix} -4 & 0 \\ 1 & 2 \end{bmatrix}$

$(3A-2B^T)^T=\begin{bmatrix} x & y \\ z & t \end{bmatrix}$ $\Rightarrow$ **x + z = ?**

A) 15 B) 18 C) 24 D) 30 E) 32

5. $A=\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$, $B=\begin{bmatrix} 1 & 6 \end{bmatrix}$ $\Rightarrow$ **$(A \cdot B)^T$ = ?**

A) $\begin{bmatrix} 1 & 2 & 3 \\ 6 & 12 & 18 \end{bmatrix}$ B) $\begin{bmatrix} 6 & 12 & 18 \\ 1 & 2 & 3 \end{bmatrix}$ C) $\begin{bmatrix} 1 & 6 \\ 2 & 12 \\ 3 & 18 \end{bmatrix}$ D) $\begin{bmatrix} 6 & 1 \\ 12 & 2 \\ 18 & 3 \end{bmatrix}$ E) $\begin{bmatrix} 4 & 5 & 6 \\ 6 & 12 & 18 \end{bmatrix}$

6. $A=\begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$ $\Rightarrow$ **$A \cdot A^T$ = ?**

A) $\begin{bmatrix} 12 & 13 \\ 13 & 16 \end{bmatrix}$ B) $\begin{bmatrix} 11 & 12 \\ 12 & 15 \end{bmatrix}$ C) $\begin{bmatrix} 13 & 14 \\ 14 & 17 \end{bmatrix}$ D) $\begin{bmatrix} 14 & 13 \\ 17 & 14 \end{bmatrix}$ E) $\begin{bmatrix} 13 & 12 \\ 16 & 13 \end{bmatrix}$

7. $A=\begin{bmatrix} 2 & 3 & 5 \\ 1 & 0 & 4 \end{bmatrix}$ $\Rightarrow$ **$A \cdot A^T$ = ?**

A) $\begin{bmatrix} 38 & 19 \\ 19 & 17 \end{bmatrix}$ B) $\begin{bmatrix} 38 & 20 \\ 20 & 17 \end{bmatrix}$ C) $\begin{bmatrix} 38 & 21 \\ 21 & 17 \end{bmatrix}$ D) $\begin{bmatrix} 38 & 22 \\ 22 & 17 \end{bmatrix}$ E) $\begin{bmatrix} 38 & 23 \\ 23 & 17 \end{bmatrix}$

8. $A=\begin{bmatrix} 2 & 3 & 1 \\ -1 & 0 & 2 \end{bmatrix}$, $B=\begin{bmatrix} 1 & 1 \\ 0 & 1 \\ 1 & 1 \end{bmatrix}$ $\Rightarrow$ **$(A \cdot B)^T$ = ?**

A) $\begin{bmatrix} 3 & 1 \\ 6 & 1 \end{bmatrix}$ B) $\begin{bmatrix} 3 & 1 \\ 1 & 6 \end{bmatrix}$ C) $\begin{bmatrix} 3 & 0 \\ 6 & 1 \end{bmatrix}$ D) $\begin{bmatrix} 3 & 6 \\ 1 & 1 \end{bmatrix}$ E) $\begin{bmatrix} 6 & 1 \\ 3 & 1 \end{bmatrix}$

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9. $A=\begin{bmatrix}2 & -2\\ -2 & 3\end{bmatrix}$, $A^{-1}=\begin{bmatrix}a & b\\ c & d\end{bmatrix}$

$\Rightarrow$ **a + b + c + d = ?**

A) $\frac{7}{2}$ B) 4 C) $\frac{9}{2}$ D) 5 E) $\frac{11}{2}$

10. $A=\begin{bmatrix}a & 3\\ a+1 & 5\end{bmatrix}$, $A^{-1}=\begin{bmatrix}-5 & 3\\ 2 & -1\end{bmatrix}$

$\Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

11. $A=\begin{bmatrix}3 & -5\\ 4 & -7\end{bmatrix}$, $A^{-1}=\begin{bmatrix}a & b\\ c & d\end{bmatrix}$

$\Rightarrow$ **a + b + c + d = ?**

A) –5 B) –3 C) 0 D) 3 E) 5

12. $A=\begin{bmatrix}3 & 2\\ 7 & 5\end{bmatrix}$, $A^{-2}=\begin{bmatrix}a & b\\ c & d\end{bmatrix}$

$\Rightarrow$ **a + b + c + d = ?**

A) 10 B) 8 C) –8 D) –10 E) –18

13. $A=\begin{bmatrix}-1 & 2\\ 3 & 7\end{bmatrix}$, $A\cdot B=\begin{bmatrix}-2 & 3\\ 6 & 4\end{bmatrix}$ $\Rightarrow$ **B^{-1} = ?**

A) $\begin{bmatrix}0 & 1\\ 3 & 7\end{bmatrix}$ B) $\begin{bmatrix}1/2 & 0\\ 1/2 & 1\end{bmatrix}$ C) $\begin{bmatrix}1/2 & 0\\ 1/2 & -1\end{bmatrix}$

D) $\begin{bmatrix}1/2 & 1/2\\ 0 & 1\end{bmatrix}$ E) $\begin{bmatrix}1 & 0\\ 1/2 & 1\end{bmatrix}$

14. $A=\begin{bmatrix}-1 & 3\\ 2 & 1\end{bmatrix}$, $A\cdot B=\begin{bmatrix}-3 & 2\\ 0 & -1\end{bmatrix}$ $\Rightarrow$ **B = ?**

A) $\frac{1}{4}\cdot\begin{bmatrix}3 & -5\\ 6 & 3\end{bmatrix}$ B) $\frac{1}{5}\cdot\begin{bmatrix}3 & -5\\ 6 & 3\end{bmatrix}$ C) $\frac{1}{6}\cdot\begin{bmatrix}3 & -5\\ 6 & 3\end{bmatrix}$

D) $\frac{1}{7}\cdot\begin{bmatrix}3 & -5\\ -6 & 3\end{bmatrix}$ E) $\frac{1}{8}\cdot\begin{bmatrix}3 & -5\\ 6 & 3\end{bmatrix}$

15. $A=\begin{bmatrix}x & x-1\\ 2 & -x\end{bmatrix}$, $A^{-1}=A$ $\Rightarrow$ **$\sum x$ = ?**

A) –2 B) 0 C) 1 D) 2 E) 3

16. $M=\begin{bmatrix}-3 & 1\\ -1 & 2\end{bmatrix}$, $N=\begin{bmatrix}1 & 2\\ 0 & 1\\ -2 & 0\end{bmatrix}$ $\Rightarrow$ **$M^{-1}\cdot N^{T}$ = ?**

A) $\frac{1}{4}\cdot\begin{bmatrix}0 & 1 & 4\\ 5 & 3 & 2\end{bmatrix}$ B) $\frac{1}{5}\cdot\begin{bmatrix}0 & 1 & 4\\ 5 & 3 & 2\end{bmatrix}$ C) $\frac{1}{6}\cdot\begin{bmatrix}0 & 1 & 4\\ 5 & 3 & 2\end{bmatrix}$

D) $\frac{1}{7}\cdot\begin{bmatrix}0 & 1 & 4\\ 5 & 3 & 2\end{bmatrix}$ E) $\frac{1}{8}\cdot\begin{bmatrix}0 & 1 & 4\\ 5 & 3 & 2\end{bmatrix}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	D	B	D	A	C	D	A
9	10	11	12	13	14	15	16
C	A	D	D	D	D	A	B

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1. $A=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix} \Rightarrow \det(A)=?$

A) –2 B) 4 C) 6 D) 12 E) 14

2. $\begin{vmatrix}1995 & 1999\\ 1991 & 1995\end{vmatrix}=?$

A) 4 B) 6 C) 8 D) 12 E) 16

3. $\begin{vmatrix}2018 & 2019\\ 2017 & 2018\end{vmatrix}=?$

A) 1 B) 3 C) 5 D) 7 E) 9

4. $\begin{vmatrix}x-2 & -3\\ -4 & x-1\end{vmatrix}=0 \Rightarrow \text{ÇK(SS)}=?$

A) $\{0\}$ B) $\{-2\}$ C) $\{-2,5\}$ D) $\{5\}$ E) $\{0,5\}$

5. $\begin{vmatrix}x+1 & 2\\ 5 & x-2\end{vmatrix}=0 \Rightarrow \prod x=?$

A) –12 B) –9 C) –6 D) –3 E) –1

6. $\begin{vmatrix}x-2 & -5\\ -1 & x+3\end{vmatrix}=9 \Rightarrow \sum x=?$

A) –5 B) –4 C) –2 D) –1 E) 9

7. $\begin{vmatrix}1 & 2 & 3\\ 3 & -2 & -1\\ 2 & 1 & 3\end{vmatrix}=?$

A) –3 B) –6 C) –12 D) –15 E) –18

8. $\begin{vmatrix}3 & 9 & 27\\ 2 & 4 & 8\\ 1 & 1 & 1\end{vmatrix}=?$

A) –12 B) –14 C) –16 D) –18 E) –20

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9. $\begin{vmatrix} 2 & 3 & 4 \\ 4 & 2 & 3 \\ 3 & 4 & 2 \end{vmatrix} = ?$

A) 9 B) 27 C) 54 D) 81 E) –1

10. $A = \begin{bmatrix} 2 & 1 & 2 \\ 3 & 4 & 5 \\ 0 & 1 & 2 \end{bmatrix} \Rightarrow |A| = ?$

A) 5 B) 6 C) 8 D) 10 E) 12

11. $\begin{vmatrix} 3 & x & 2x \\ 0 & x & 99 \\ 0 & 0 & x-1 \end{vmatrix} = 60 \Rightarrow \prod x = ?$

A) –10 B) –20 C) –30 D) –40 E) –50

12. $\begin{vmatrix} t & 1 & t \\ 20 & 30 & 40 \\ 4t & 10 & 4t \end{vmatrix} = -60 \Rightarrow t = ?$

A) -1 B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) -1 E) 2

13. $\begin{vmatrix} 1 & 0 & 0 \\ 1 & x & 1 \\ 0 & 3 & 2 \end{vmatrix} = 1 \Rightarrow x = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

14. $\begin{vmatrix} 3x-2 & x+1 \\ 2x-1 & 2x+3 \end{vmatrix} = 0 \Rightarrow x_1 + x_2 = ?$

A) 1 B) –1 C) $\frac{1}{2}$ D) $-\frac{3}{4}$ E) $-\frac{3}{2}$

15. $A = \begin{bmatrix} x & y \\ -x & y \end{bmatrix}$, $B = \begin{bmatrix} x & 0 \\ 0 & y \end{bmatrix}$

$\det(A+B) = 10 \Rightarrow \det A + \det B = ?$

A) 4 B) 6 C) 8 D) 10 E) 12

16. $A = \begin{bmatrix} 1 & x \\ -3 & 2 \end{bmatrix}$, $B = \begin{bmatrix} -1 & 2 \\ 3 & -2 \end{bmatrix}$

$\det(A \cdot B) = 4 \Rightarrow x = ?$

A) –3 B) –1 C) 1 D) 3 E) 5

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	E	A	C	A	D	B	A
9	10	11	12	13	14	15	16
B	B	B	C	C	B	B	B

1. $\begin{vmatrix} 2008 & 2012 \\ 2004 & 2008 \end{vmatrix} = ?$

A) 4 B) 6 C) 8 D) 12 E) 16

2. $A = \begin{bmatrix} \log_2 3 & -3 \\ 4 & \log_9 8 \end{bmatrix} \Rightarrow |A| = ?$

A) 9 B) 10 C) $\frac{25}{3}$ D) $\frac{27}{2}$ E) $\frac{29}{2}$

3. $\begin{vmatrix} \sin 24^\circ & \cos 24^\circ \\ \cos 36^\circ & \sin 36^\circ \end{vmatrix} = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) 1 D) $\frac{1}{2}$ E) $\frac{\sqrt{3}}{2}$

4. $A = \begin{bmatrix} \sin 75^\circ & \cos 75^\circ \\ \sin 15^\circ & \cos 15^\circ \end{bmatrix} \Rightarrow |A| = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $-\frac{1}{2}$ C) 1 D) $\frac{1}{2}$ E) $\frac{\sqrt{3}}{2}$

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5. $\begin{vmatrix} x+2 & -x \\ 3 & x-3 \end{vmatrix} = ax^2 + bx + c \Rightarrow a + b + c = ?$

A) –9 B) –6 C) –3 D) 6 E) 9

6. $f(x) = \begin{vmatrix} e^{2x} & e^{-x} \\ e^{-2x} & e^{2x} \end{vmatrix} \Rightarrow f(\ln 2) = ?$

A) $\frac{63}{8}$ B) $\frac{65}{8}$ C) $\frac{127}{8}$ D) $\frac{129}{8}$ E) $\frac{63}{4}$

7. $\begin{bmatrix} 1 & 2 \end{bmatrix} \cdot \begin{bmatrix} 1 & 0 \\ 3 & 1 \end{bmatrix}^{-1} \cdot \begin{bmatrix} 2 \\ 1 \end{bmatrix} = ?$

A) $[-16]$ B) $[-8]$ C) $\begin{bmatrix} -5 \\ 2 \end{bmatrix}$ D) $[-5 \quad 2]$ E) $[-1]$

8. $x^2 - 5x - 8 = 0$, ÇK(SS) = {m, n}

$A = \begin{bmatrix} m & 2 & 1 \\ 1 & n & 3 \\ 3 & 1 & 2 \end{bmatrix} \Rightarrow |A| = ?$

A) –20 B) –18 C) –16 D) 24 E) 26

9. $x \in R^+$,

$\begin{vmatrix} 1 & x & 3x \\ -2x & 0 & -x \\ -1 & 1 & 0 \end{vmatrix} = 0 \Rightarrow$ **x = ?**

A) $\frac{1}{5}$ B) $\frac{1}{3}$ C) $\frac{2}{3}$ D) $\frac{3}{4}$ E) $\frac{3}{2}$

10. $f(x) = \begin{vmatrix} 3\cos x & 1+\sin x \\ 1-\sin x & \cos x \end{vmatrix} \Rightarrow$ $\mathbf{f\left(\frac{\pi}{6}\right) = ?}$

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{4}{3}$

11. $\begin{vmatrix} e^{2x} & e^{3} \\ e^{-3} & e^{x} \end{vmatrix} = 26 \Rightarrow$ **x = ?**

A) ln2 B) ln3 C) ln5 D) ln6 E) ln9

12. $\sum_{x=1}^{10} \begin{vmatrix} 1 & x \\ x & 2 \end{vmatrix} = ?$

A) –365 B) –245 C) –215 D) –180 E) –185

13. $\mathbf{i^2 = -1,} \quad \begin{vmatrix} \mathbf{i} & \mathbf{1} & \mathbf{i} \\ \mathbf{2} & \mathbf{0} & \mathbf{-i} \\ \mathbf{-1} & \mathbf{0} & \mathbf{1} \end{vmatrix} = ?$

A) i +1 B) i – 1 C) i+2 D) i – 2 E) i+4

14. $\begin{vmatrix} 3 & -2k \\ 1 & -1 \end{vmatrix} \cdot \begin{vmatrix} 1 & 0 \\ -1 & 2 \end{vmatrix} = \begin{vmatrix} 1 & 1 \\ -3 & k \end{vmatrix} \Rightarrow$ **k = ?**

A) –4 B) –3 C) –2 D) 2 E) 3

15. $A = \begin{bmatrix} 1 & x \\ -3 & 2 \end{bmatrix}, B = \begin{bmatrix} -1 & 2 \\ 3 & -2 \end{bmatrix}$

$\det(A \cdot B) = 4 \Rightarrow$ **x = ?**

A) –3 B) –1 C) 1 D) 3 E) 5

16. $A = \begin{bmatrix} x+7 & -4 & 4 \\ -1 & x+4 & -6 \\ 8 & -8 & x+6 \end{bmatrix}, \ \det(A) = 0$

$\Rightarrow$ **ÇK(SS) = ?**

A) $\{-16\}$ B) $\{-16, -3\}$ C) $\{2\}$ D) $\{-16, 2\}$ E) $\{-16, -3, 2\}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	D	B	E	C	C	B	C
9	10	11	12	13	14	15	16
A	C	B	A	D	E	B	E

1. $A = \begin{bmatrix} \log_2 27 & x \\ -2 & \log_3 4 \end{bmatrix}$, $\det A = -4 \Rightarrow$ **x = ?**

A) –5 B) –4 C) –2 D) 2 E) 4

2. $\begin{vmatrix} e^{4x} & -e^{3-x} \\ e^{3x-3} & e^{-4x} \end{vmatrix} = 82 \Rightarrow$ **x = ?**

A) ln3 B) 2ln3 C) 3ln3 D) 2ln2 E) 3ln2

3. $x \in Z$,

$\begin{vmatrix} 3 & -5 \\ -4 & |2x-3| \end{vmatrix} = 1 \Rightarrow \sum$ **x = ?**

A) –3 B) –2 C) 1 D) 2 E) 3

4. $\frac{\pi}{2} < x < \pi$,

$A = \begin{bmatrix} 1-\cos x & 1-\sin x \\ \sin x & 1+\cos x \end{bmatrix}$, $|A| = 0 \Rightarrow$ **x = ?**

A) $\frac{\pi}{6}$ B) $\frac{3\pi}{4}$ C) $\frac{4\pi}{5}$ D) $\frac{5\pi}{6}$ E) $\frac{7\pi}{8}$

5. $\begin{vmatrix} \sin 3x & \cos 3x \\ \sin 2x & \cos 2x \end{vmatrix} = \cos\frac{\pi}{3}$, $0 < x < \frac{\pi}{2} \Rightarrow$ **x = ?**

A) $\frac{\pi}{8}$ B) $\frac{\pi}{6}$ C) $\frac{\pi}{5}$ D) $\frac{\pi}{4}$ E) $\frac{\pi}{3}$

6. $\begin{vmatrix} 3 & -2x \\ 1 & -1 \end{vmatrix} \cdot \begin{vmatrix} 1 & 2 \\ -1 & 2 \end{vmatrix} = \begin{vmatrix} 1 & 2 \\ -1 & x \end{vmatrix} \Rightarrow$ **x = ?**

A) –3 B) –2 C) 2 D) 4 E) 5

7. $A = \begin{bmatrix} 1 & 2 \\ 3 & 7 \end{bmatrix} \Rightarrow$ **$\det(A^{-1})$ = ?**

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{1}{4}$ E) $\frac{1}{6}$

8. $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$, $A \cdot B = \begin{bmatrix} -1 & 7 \\ -3 & 11 \end{bmatrix} \Rightarrow$ **|B| = ?**

A) –16 B) –5 C) 5 D) 12 E) 16

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9. $\begin{vmatrix} 1 & -1 & 0 \\ 1 & 2 & 3 \\ 0 & 1 & -2 \end{vmatrix} = ?$

A) –9 B) –7 C) –3 D) 3 E) 9

10. $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & -1 & 1 \\ 2 & 1 & -2 \end{bmatrix} \Rightarrow \mathbf{det(A) = ?}$

A) 7 B) 8 C) 9 D) 10 E) 11

11. $\begin{vmatrix} 10 & 20 & 30 \\ 0 & -1 & 1 \\ 2 & 1 & -2 \end{vmatrix} = ?$

A) 90 B) 100 C) 110 D) 120 E) 130

12. $A = \begin{bmatrix} -3 & 4 & 0 \\ 0 & 1 & 3 \\ x-2 & 0 & -2 \end{bmatrix},\ |A| = 6 \Rightarrow \mathbf{x = ?}$

A) –2 B) –1 C) 0 D) 1 E) 2

13. $x \in R^+$,

$\begin{vmatrix} 2 & 0 & x \\ -x & 4 & 0 \\ 0 & -2 & x^2 \end{vmatrix} = 40 \Rightarrow \mathbf{x = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

14. $i^2 = -1$,

$\begin{vmatrix} 2i & i-2 & i+1 \\ 1 & 0 & 1 \\ i & 1 & -1 \end{vmatrix} = x + yi \Rightarrow \mathbf{x - y = ?}$

A) –4 B) –2 C) 0 D) 2 E) 4

15. $A = \begin{bmatrix} 1 & 0 & 2 \\ 3 & 1 & 0 \\ 2 & 1 & 1 \end{bmatrix} \Rightarrow \mathbf{|A^{-1}| = ?}$

A) $-\frac{1}{3}$ B) $-\frac{1}{9}$ C) $\frac{1}{3}$ D) $\frac{1}{9}$ E) $\frac{1}{81}$

16. $\begin{vmatrix} x+2 & -4 & 3 \\ -1 & x-3 & -1 \\ x+1 & -5 & x+1 \end{vmatrix} = 0 \Rightarrow \mathbf{ÇK(SS) = ?}$

A) $\{-2\}$ B) $\{1\}$ C) $\{1,4\}$
D) $\{-2,1\}$ E) $\{-2,1,4\}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	B	E	D	B	C	A	B
9	10	11	12	13	14	15	16
A	E	C	E	B	C	C	E

1. $\left.\begin{matrix} 3x-y=2 \\ 5x+2y=3 \end{matrix}\right\} \Rightarrow A\cdot\begin{bmatrix} x \\ y \end{bmatrix}=\begin{bmatrix} 2 \\ 3 \end{bmatrix},$

$A\cdot\begin{bmatrix} 1 \\ 2 \end{bmatrix}=\begin{bmatrix} a \\ b \end{bmatrix} \Rightarrow$ **a + b = ?**

A) 4 B) 6 C) 8 D) 10 E) 12

2. $A=\begin{bmatrix} 1 & 0 \\ -1 & 3 \end{bmatrix},\ B=\begin{bmatrix} -1 & 1 \\ 0 & m \end{bmatrix}$

$\det(A+B)=\det(A)+\det(B)$

$\Rightarrow$ **m = ?**

A) – 3 B) – 1 C) 0 D) 2 E) 4

3. $A^{-1}=\begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix}$

$A\cdot\begin{bmatrix} 1 \\ a \end{bmatrix}=\begin{bmatrix} b \\ 4 \end{bmatrix}$

$\Rightarrow$ **a + b = ?**

A) 5 B) 7 C) 8 D) 9 E) 11

4. $A^2=\begin{bmatrix} 2 & 1 \\ 1 & 5 \end{bmatrix} \Rightarrow \left|(A-I_2)\cdot(A+I_2)\right| = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

5. A_{3x3},

$\begin{bmatrix} 2 & 1 & 3 \end{bmatrix}\cdot A=\begin{bmatrix} 0 & 2 & 2 \end{bmatrix}$

$\begin{bmatrix} 1 & 4 & 0 \end{bmatrix}\cdot A=\begin{bmatrix} 3 & 1 & 5 \end{bmatrix}$

$\Rightarrow \begin{bmatrix} 5 & 6 & 6 \end{bmatrix}\cdot A = ?$

A) $\begin{bmatrix} 2 & 1 & 3 \end{bmatrix}$ B) $\begin{bmatrix} 3 & 3 & 7 \end{bmatrix}$ C) $\begin{bmatrix} 3 & 5 & 9 \end{bmatrix}$

D) $\begin{bmatrix} 6 & 2 & 10 \end{bmatrix}$ E) $\begin{bmatrix} 6 & 4 & 12 \end{bmatrix}$

6. $m\in R^+,\ u=\begin{bmatrix} x & y \end{bmatrix},$

$u\cdot\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}=u\cdot\begin{bmatrix} m & 0 \\ 0 & m \end{bmatrix}$

matris denkleminin sonsuz sayıda u çözümü olduğuna göre, m kaçtır?

If the matrix equation has infinite number of solutions foru , what is m?

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{2}{3}$ D) 3 E) 4

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7. $\begin{bmatrix}2 & 1\end{bmatrix}\cdot\begin{bmatrix}1 & 0\\3 & 1\end{bmatrix}^{-1}\cdot\begin{bmatrix}1\\4\end{bmatrix}=\begin{bmatrix}a\end{bmatrix}$

$\Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

8. $A=\begin{bmatrix}1 & 1\\0 & 1\end{bmatrix}$, $B=\begin{bmatrix}1 & 0\\1 & 1\end{bmatrix}$

$\Rightarrow$ **$\det(A^2-B^2)=?$**

A) –4 B) 0 C) 1 D) 2 E) 4

9. $A=\begin{bmatrix}1 & 0\\-1 & 1\end{bmatrix}$, $B=\begin{bmatrix}1 & 0\\1 & 1\end{bmatrix}$

$A\cdot X=B \Rightarrow$ **X = ?**

A) $\begin{bmatrix}1 & -2\\0 & 1\end{bmatrix}$ B) $\begin{bmatrix}0 & 1\\1 & 0\end{bmatrix}$ C) $\begin{bmatrix}1 & 0\\2 & 1\end{bmatrix}$

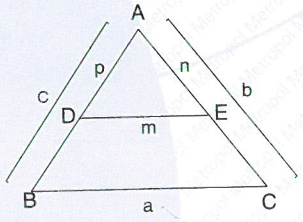
D) $\begin{bmatrix}-1 & 0\\1 & -2\end{bmatrix}$ E) $\begin{bmatrix}0 & -1\\2 & 1\end{bmatrix}$

10. $A=\begin{bmatrix}1 & 3 & 5\\3 & 0 & 7\\1 & 3 & a-9\end{bmatrix}$ **matrisinin ters matrisinin olmaması için a kaç olmalıdır?**

For the inverse matrix of A not to exist, what should the value o a be?

A) 15 B) 14 C) 11 D) 6 E) 5

11.



[DE] // [BC]

$\Rightarrow \begin{vmatrix}1 & 2 & 3\\m & n & p\\a & b & c\end{vmatrix}=?$

A) 6 B) 3 C) 2 D) 1 E) 0

12. $A_{m\times n}$,

$B=A^T+A \Rightarrow$ **$B^T=?$**

A) B^{-1} B) B C) A^{-1} D) A^T E) A

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
D	D	B	B	C	D	C	E	C	B	E	B

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1. $\left.\begin{matrix} A+2B=\begin{bmatrix}3 & -4\\ 0 & 6\end{bmatrix} \\ A-3B=\begin{bmatrix}3 & 1\\ 5 & -4\end{bmatrix}\end{matrix}\right\} \Rightarrow$ **A = ?**

A) $\begin{bmatrix}3 & -2\\ 2 & 2\end{bmatrix}$ B) $\begin{bmatrix}3 & -2\\ -2 & -2\end{bmatrix}$ C) $\begin{bmatrix}3 & 2\\ 2 & 2\end{bmatrix}$

D) $\begin{bmatrix}-3 & 2\\ 2 & 2\end{bmatrix}$ E) $\begin{bmatrix}-3 & -2\\ -2 & -2\end{bmatrix}$

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

2. $A=[2 \;\; 1 \;\; -1 \;\; 2]$, $B=\begin{bmatrix}1 & 0 & 2 & 3\\ 2 & 1 & 3 & 4\end{bmatrix}$

$\Rightarrow$ **$A \times B^T = ?$**

A) $[3 \;\; 5]$ B) $[6 \;\; 10]$ C) $[4 \;\; 10]$

D) $[6 \;\; 9]$ E) $[5 \;\; 3]$

[FIRAT ÜNİVERSİTESİ – YÖS 2018]

3. $A=\begin{bmatrix}1 & 0\\ -5 & 1\end{bmatrix} \Rightarrow$ **$A^{14} = ?$**

A) $\begin{bmatrix}1 & 5\\ -14 & 1\end{bmatrix}$ B) $\begin{bmatrix}1 & 0\\ -42 & 1\end{bmatrix}$ C) $\begin{bmatrix}1 & 0\\ -70 & 1\end{bmatrix}$

D) $\begin{bmatrix}1 & -5\\ 0 & 1\end{bmatrix}$ E) $\begin{bmatrix}1 & 0\\ -35 & 1\end{bmatrix}$

[FIRAT ÜNİVERSİTESİ – YÖS 2018]

4. $A=\begin{bmatrix}-2 & 3\\ 4 & 2\end{bmatrix} \Rightarrow$ **$A^{2006} = ?$**

A) $2^{4012} \cdot \begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ B) $2^{4012} \cdot \begin{bmatrix}2 & 3\\ 5 & 8\end{bmatrix}$

C) $2^{1003} \cdot \begin{bmatrix}2 & 3\\ 5 & 8\end{bmatrix}$ D) $2^{4012} \cdot \begin{bmatrix}0 & 1\\ 1 & 0\end{bmatrix}$

E) $2^{1003} \cdot \begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

5. $A=\begin{bmatrix}2 & -1\\ 0 & 3\end{bmatrix}$, $B=\begin{bmatrix}4 & -2\\ 1 & 3\end{bmatrix}$

$\Rightarrow$ **$\det(A \cdot B) = ?$**

A) 84 B) 81 C) 80 D) 78 E) 75

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

6. $\begin{vmatrix}1 & 2 & 3\\ 4 & 5 & 6\\ -7 & -8 & -9\end{vmatrix} + \begin{vmatrix}1 & 2 & 3\\ 4 & 5 & 6\\ 7 & 8 & 9\end{vmatrix} = ?$

A) 0 B) 1 C) 7 D) 10 E) 12

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

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7. $A+B=\begin{bmatrix}1 & 3\\ 2 & 1\end{bmatrix},\ A-2B=\begin{bmatrix}3 & 1\\ -1 & 2\end{bmatrix} \Rightarrow$ **A = ?**

A) $\begin{bmatrix}5/3 & 7/3\\ 1 & 4/3\end{bmatrix}$ B) $\begin{bmatrix}5/3 & 7/3\\ -1 & 4/3\end{bmatrix}$

C) $\begin{bmatrix}4/3 & 7/3\\ -1/3 & 5/3\end{bmatrix}$ D) $\begin{bmatrix}4/3 & 7/3\\ -1/3 & -5/3\end{bmatrix}$

E) $\begin{bmatrix}5/3 & -7/3\\ -1 & -4/3\end{bmatrix}$

[İSTANBUL ÜNİVERSİTESİ –YÖS 2016]

8. $A=\begin{bmatrix}-1 & -1\\ 0 & 3\end{bmatrix},\ B=\begin{bmatrix}2 & 0\\ 1 & 3\end{bmatrix} \Rightarrow$ **det(A · B) = ?**

A) 4 B) 10 C) –18 D) –3 E) –9

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

9. $\left.\begin{aligned}3A+B&=\begin{bmatrix}9 & -1\\ 9 & 3\end{bmatrix}\\ A-B&=\begin{bmatrix}3 & -11\\ -1 & 1\end{bmatrix}\end{aligned}\right\} \Rightarrow$ **A = ?**

A) $\begin{bmatrix}-2 & 1\\ 4 & 3\end{bmatrix}$ B) $\begin{bmatrix}3 & -3\\ 2 & 1\end{bmatrix}$ C) $\begin{bmatrix}4 & -3\\ 2 & 1\end{bmatrix}$

D) $\begin{bmatrix}0 & 3\\ 5 & 7\end{bmatrix}$ E) $\begin{bmatrix}-1 & 4\\ 2 & 1\end{bmatrix}$

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

10. $\begin{bmatrix}3 & -1\\ 1 & 0\end{bmatrix}\cdot\begin{bmatrix}a\\ b\end{bmatrix}=\begin{bmatrix}5\\ 2\end{bmatrix} \Rightarrow$ **a · b = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

11. $A=\begin{bmatrix}1 & 4 & -1\\ 2 & 3 & -2\\ 0 & 3 & x-2\end{bmatrix}$ **matrisinin ters matrisinin olmaması için x kaç olmalıdır?**

For the inverse matrix of A not to exist, what should x be?

A) 2 B) 3 C) 4 D) 5 E) 6

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

12. $x_1\cdot\begin{bmatrix}1\\ 1\end{bmatrix}+x_2\cdot\begin{bmatrix}1\\ -2\end{bmatrix}=\begin{bmatrix}a\\ b\end{bmatrix} \Rightarrow$ **x_1 = ?**

A) $a+2b$ B) $\frac{a-2b}{3}$ C) $\frac{2a+b}{3}$

D) $\frac{a+2b}{3}$ E) $\frac{2a-b}{3}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
A	B	C	A	A	A	A	C	B	E	A	C

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